Vol. 1038 Number 3

OFFICIAL GAZETTE

of the UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

January 17, 1984

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. The search fee for the European Patent Office was changed as of Jan. 22, 1983 and was announced at 1025 O.G. 27 on Dec. 28, 1982. International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	295.00
Basic Supplemental Fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Nov. 14, 1983. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,296,547, Re. S.N. 546,106, Filed Oct. 27, 1983, Cl. 29/766, APPARATUS FOR LOADING A PULL TAB ON A SLIDER BODY, Tsutomu Hakoi, Owner of Record: *Yoshida Kogyo K. K., Tokyo, Japan,* Attorney or Agent: James van Santen, et al., Ex. Gp.: 321

4,296,680, Re. S.N. 545,980, Filed Oct. 27, 1983, Cl. 92/98.4, COUPLED SHELLS FOR VACUUM POWER SERVO BOOSTER, Ryuji Ohta, et al., Owner of Record: *Jidosha Kiki Co. Ltd., Tokyo, Japan,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 341

4,338,390, Re. S.N. 556,515, Filed Nov. 30, 1983, Cl. 430/106, QUARTERNARY AMMONIUM SULFATE OR SULFONATE CHARGE CONTROL AGENTS FOR ELECTROPHOTOGRAPHIC DEVELOPERS COMPATIBLE WITH VITON FUSER, Chin H. Lu, Owner of Record: *Xerox Corp., Stamford, Conn.,* Attorney or Agent: John E. Beck, et al., Ex. Gp.: 166

4,365,500, Re. S.N. 554,537, Filed Nov. 23, 1983, Cl. 72/387, WEB BENDING FIXTURE, Roger Klukow, Owner of Record: *Chesley F. Carlson Co., Minneapolis, Minn.,* Attorney or Agent: William C. Babcock, et al., Ex. Gp.: 321

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Craig Denney Productions, dba Republic Arts Pictures, Long Beach, Calif., Reg. No. 1,109,710, for the mark A REPUBLIC PICTURE and design, Can. No. 13,855.

John Martin Designers Ltd., New York, N.Y., Reg. No. 1,100,849, for the mark JOHN MARTIN, Can. No. 13,864.

Naris Cosmetics Co., Ltd., Los Angeles, Calif., Reg. No. 1,093,040, for the mark VEGA (stylized), Can. No. 13,883.

Schacht Associates, Inc., Bronx, N.Y., Reg. No. 757,149, for the mark COMPAK, Can. No. 13,918.

MKD Corp., Cherry Hill, N.J., Reg. No. 1,109,199, for the mark SPRINT, Can. No. 13,927.

Frostie Enterprises, assignee, by merger of Tasty-Mates Co., Camden, N.J., Reg. No. 908,720, for the mark TRADER JACK, Can. No. 13,930.

ERMA S. BROWN,
Deputy Clerk, Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Service by Publication

A concurrent use proceeding involving the registration identified below having been instituted, and the notice of such known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the concurrent use proceeding will be proceeded with as in the case of default.

Afternoon Delight, Inc., Richmond, Va., Reg. No. 1,088,383, for the mark AFTERNOON DELIGHT, Con. Use No. 527.

ERMA S. BROWN,
Deputy Clerk,
Trademark Trial and
Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

VACANCY ANNOUNCEMENT

Announcement Number: PTO-83-234
Opening Date: Dec. 23, 1983
Closing Date: Feb. 7, 1984

Title, Series, and Grade
Examiner-in-Chief (1 position)
AD-1224-17 equivalent
Salary: $63,800 per annum maximum
(POTENTIAL INCREASE DEPENDING UPON CONGRESSIONAL APPROVAL)

Vacancy Location
Board of Appeals

Who May Apply
Applications will be accepted from Department of Commerce candidates and other status and nonstatus candidates worldwide

Distribution of Announcement
Department of Commerce and Worldwide

Duties: Serves as a member of the Board of Appeals of the Patent and Trademark Office. As an Examiner-in-Chief, participates in its appellate and administrative responsibilities and exercises independent judgement on all matters before him/her on appeal, subject to administrative and policy direction of the Commissioner. Appeals filed in accordance with 35 U.S.C. 134 and 37 CFR 1.191 throught 1.198 of the *Rules of Practice* of the U.S. Patent and Trademark Office in patent cases involve complex legal and technical questions. The Board of Appeals has the sole power to hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents and for reissue of patents. Final decisions of the Board, if unfavorable to an applicant, may be appealed to the United States Court of Appeals for the Federal Circuit or civil action may be taken in accordance with 35 U.S.C. 145.

Experience Requirements: Candidates must possess (1) a minimum of five years of patent experience of which at least two years involved the exercise of independent judgement in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office; (2) a law degree or be a member in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the Constitution; (3) a high degree of demonstrated competence in mechanical technology; (4) ability to write clearly and logically; (5) comprehensive experience in patent prosecution, examination, or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

Evaluation of Qualified Candidates will be on the basis of experience, training (formal education, in-house courses, conferences, seminars, etc. — GIVE DATES ATTENDED AND HOURS OF INSTRUCTION), awards (medals, cash awards, SAA, Outstanding Performance Rating, QSI, etc. — GIVE DATE RECEIVED), and supervisory appraisals. NOTE: The qualifications of the proposed incumbent will have to be reviewed and approved by the Department of Commerce before an appointment can be made effective.

Completed Forms Must Be Received by Feb. 7, 1984.

How To Apply Submit the following:
1) Personal Qualifications Statement, SF-171
2) Merit Program Interest Statement, CD-261 (DOC employees only)
3) Current supervisory appraisal on your agency's form or on CD-362 (letters of reference for outside candidates)
4) Background Survey Questionnaire, OPM Form 1386
5) Narrative Performance Rating
6) Examiner-in-Chief Questionnaire

Where To Apply
U.S. Patent and Trademark Office
Office of Personnel
Crystal Mall 2, Room 925
1921 Jefferson Davis Hwy.
Arlington, Va. 22202
Attn: Doris Mouser (703) 557-3631

To Assist the Personnel Office in Assessing Your Qualifications, Please Remember to Include the Following Information on SF-171:
1) The type of awards received and the date issued.
2) The total number of classroom hours for each training class.

Mailing Address
U.S. Patent and Trademark Office
Office of Personnel
CM-2, Room 925
Washington, D.C. 20231

National Inventors Day

The Patent and Trademark Office, the National Council of Patent Law Associations and the National Inventors Hall of Fame Foundation, Inc. will sponsor National Inventors Day in the Public Search Room on Saturday, Feb. 11, 1984 from 1:00 p.m. to 5:00 p.m. and Sunday Feb. 12, 1984 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days. Inventors will be inducted into the National Inventors Hall of Fame on Sunday, Feb. 12, at 2:00 p.m.

In order to assemble exhibits it will be necessary to close the Search Room on Friday, Feb. 10, 1984 at 5:00 p.m. The removal of all personal property from the Search Room would be appreciated.

GERALD J. MOSSINGHOFF,
Dec. 27, 1983. *Commissioner of Patents*
and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 17, 1984

Re. 31,389	4,377,842	4,400,504	4,409,251
4,126,058	4,378,357	4,400,552	4,409,489
4,131,735	4,379,998	4,401,992	4,409,910
4,177,446	4,382,823	4,402,338	4,409,926
4,191,813	4,383,172	4,402,453	4,410,482
4,199,217	4,384,760	4,403,348	4,410,868
4,245,183	4,387,369	4,403,921	4,411,534
4,297,144	4,388,978	4,404,190	4,411,581
4,299,294	4,389,218	4,404,440	4,411,645
4,312,226	4,389,885	4,404,669	4,412,410
4,322,416	4,389,959	4,404,739	4,412,879
4,322,420	4,390,613	4,405,142	4,413,378
4,356,320	4,391,857	4,405,574	4,413,951
4,363,815	4,391,921	4,405,576	4,413,966
4,367,346	4,394,165	4,405,892	4,414,163
4,369,054	4,394,186	4,405,911	4,414,285
4,370,813	4,394,392	4,405,948	4,414,732
4,371,256	4,394,794	4,406,060	4,416,012
4,372,673	4,395,427	4,406,151	4,416,196
4,373,312	4,395,733	4,406,200	4,417,035
4,374,239	4,396,950	4,406,517	
4,375,471	4,397,153	4,407,543	
4,376,062	4,400,195	4,407,855	

Disclaimers

Re. 31,008.—*Franklin D. Barber,* Flossmoor, Ill., deceased, by a Corp. of N.J., Standard Car Truck Co., Chicago, Ill. DAMPENED RAILWAY CAR TRUCK. Patent dated Aug. 10, 1982. Disclaimer filed Oct. 17, 1983, by the assignee, *Standard Car Truck Co.,*

Hereby enters this disclaimer to claim 3 of said patent.

4,267,252.—*Elbert M. Idelson,* West Newton, Mass. CHROME COMPLEXED MAGENTA DYE DEVELOPERS. Patent dated May 12, 1981. Disclaimer filed Nov. 28, 1983, by the assignee, *Polaroid Corp.*

Hereby enters this disclaimer to claims 1–16 of said patent.

4,267,253.—*Elbert M. Idelson,* West Newton, Mass. CHROME COMPLEXED MAGENTA DYE DEVELOPERS. Patent dated May 12, 1981. Disclaimer filed Nov. 28, 1983, by the assignee, *Polaroid Corp.*

Hereby enters this disclaimer to claims 1–22 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 704-7494
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,495

HYDRAULIC JET WELL CLEANING METHOD AND APPARATUS

Casper W. Zublin, 801 Hewlett, Bakersfield, Calif. 93309

Original No. 4,349,073, dated Sep. 14, 1982, Ser. No. 195,303, Oct. 7, 1980. Application for reissue Mar. 25, 1983, Ser. No. 479,036

Int. Cl.³ E21B *37/00, 37/06*

U.S. Cl. 166—312 **3 Claims**

1. A device for washing well liners comprising:

an elongate member having jet nozzles spaced along its length;

tubing connected to [each] *one* end of said member;

a centralizer located proximate to one end of said member, said centralizer being rigid and having a central bore for slidably engaging said tubing to permit substantial axial movement along said tubing; and

means to confine said axial movement of said centralizer, said axial movement being sufficient to permit reciprocation of said tubing with respect to said centralizer, said reciprocation providing a jarring action to help free said centralizer when jammed within said liner.

2. A method for washing well liners comprising:

providing an elongate member having a plurality of jet nozzles spaced along its length, said member being of a standard size;

providing a plurality of sizes of adapters for receiving said nozzles on said member;

determining the size of said well liner; and

selecting an adapter sized to provide a jet nozzle to liner standoff distance of about 5–10 times the diameter of the nozzle orifice.

Re. 31,496

TAMPER-PROOF CLOSURE

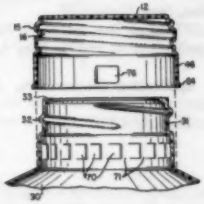
Frederick D. Keeler, Trumball, Conn., assignor to The KLM Corporation, Bridgeport, Conn.

Original No. 4,153,174, dated May 8, 1979, Ser. No. 873,978, Jan. 31, 1978. Continuation of Ser. No. 632,763, Nov. 17, 1975, abandoned, which is a continuation of Ser. No. 357,493, May 4, 1973, abandoned. Application for reissue May 7, 1981, Ser. No. 261,623

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—252 **19 Claims**

19. A tamper proof closure for a container, said closure comprising a thermoformed single integral piece of sheet thermoplastic material formed with a top wall and a flexible skirt wall depending therefrom, means formed on said skirt wall adapted for fastening to mating means on a container, said closure being thermoformed remote from the container and being of substantially uniform thickness throughout except in the areas where deformed, the thermoplastic material of the closure skirt wall being cut and bent inwardly to form a tab in the closure skirt wall from the material of the skirt wall, said tab being attached to the skirt wall



along a hinge line which is formed by moving the tab inwardly of the skirt wall and setting it in a fixed position by stressing the thermoplastic material along the hinge line, the closure skirt wall being weakened at a selected area, said tab having a free end which extends inwardly of the skirt wall adapted for engaging a portion of the container so that the portion of the closure skirt wall below said weakened area will be broken from the skirt wall as the closure is unfastened from the container.

Re. 31,497

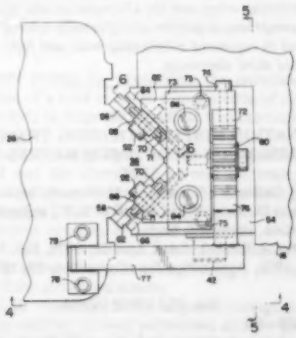
ANTI-FRICTION GIBS FOR PRESSES

Roger J. Nelsen, Hastings, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Original No. 4,161,342, dated Jul. 17, 1979, Ser. No. 857,121, Dec. 5, 1977. Application for reissue Feb. 1, 1982, Ser. No. 344,554

Int. Cl.³ F16C *29/04*

U.S. Cl. 308—6 R **5 Claims**



7. In a mechanical press having a frame including a pair of side members and a press slide therebetween, anti-friction gib means comprising: first flat rectangular steel races secured to opposite sides of said press slide; second flat rectangular steel races secured to said press side members opposite and parallel to said first steel races; rollers positioned to run between said

opposed races; linear cage means to contain said rollers; a vertically reciprocable block mounted on said press frame; means to attach the upper end of said cage means to said block; rack means secured to said press slide and adapted to reciprocate therewith; non-reciprocating rack means secured to said press frame; a pinion rotatably mounted on said reciprocable block in driven engagement with said reciprocating rack and in rolling engagement with said stationary rack, whereby said pinion reciprocates said block and said block reciprocates said linear cage responsive to the movement of said slide.

Re. 31,498

ELECTROSTATICALLY CONTROLLED PICTURE DISPLAY DEVICE

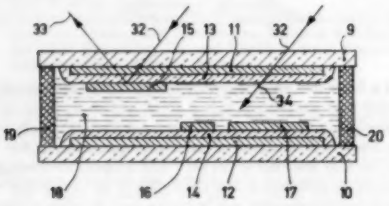
Ties S. Te Velde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Original No. 4,178,077, dated Dec. 11, 1979, Ser. No. 715,429, Aug. 18, 1976. Application for reissue May 4, 1981, Ser. No. 260,525

Claims priority, application Netherlands, Aug. 27, 1975, 7510103

Int. Cl.³ G02D *25/00*

U.S. Cl. 350—269 **8 Claims**



5. A passive picture display device which comprises a plurality of display elements for controlling the reflection of light, each display element comprising a first electrode, a second electrode and a third electrode, said third electrode being movable between said first and the second electrodes by electrostatic forces, said device further including first and second supporting plates disposed in parallel spaced relationship, said first supporting plate being transparent, said first and said second electrode of each display element being disposed on opposed surfaces of said first and second supporting plates, said first electrode on the said first supporting plate being transparent, said third electrode being provided with a pattern of light transmitting areas and the electrode on said second supporting plate comprising a pattern of differently colored areas which are disposed in registered relationship with said light transmitting areas of said third electrodes.

Re. 31,499

ILLUMINATION SYSTEM UTILIZING TWO OPPOSING DC LAMPS WITH AN OPTIMUM BARREL-SHAPED SLIT

Charles F. Gallo, Jr.; Thomas J. Hammond, both of Penfield, and James D. Rees, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original No. 4,086,010, dated Apr. 25, 1978, Ser. No. 737,299, Nov. 1, 1976. Application for reissue Oct. 22, 1979, Ser. No. 87,174

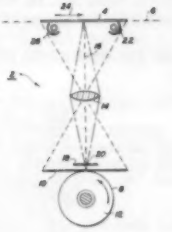
Int. Cl.³ G03B *27/54*

U.S. Cl. 355—70 **14 Claims**

7. In a photocopier, an optical system for illuminating a document to be copied at an object plane and for forming an image of said document at an imaging plane including an integral illumination source comprising the following disposed along an optical axis

(a) a first linear lamp disposed adjacent to and parallel to said object plane said first lamp being a DC gas discharge lamp having an anode at one end and a cathode at the other end thereof and having a first asymmetrical distribution pattern of output light intensity along its length,

(b) a second linear lamp similar to the first and disposed parallel to said first lamp, with the anode and cathode of said second lamp disposed at the ends thereof in the reverse polarity with respect to said first lamp, said second lamp having a second asymmetrical distribution pattern of light intensity opposite to that of said first asymmetrical distribution pattern,



said first and second asymmetrical distribution patterns of light output intensity combining in a resultant symmetrical distribution pattern of output light intensity to illuminate said object plane with non-uniform symmetrical light intensity along the dimension of said object plane corresponding to the length of said lamps, and

means for forming an image of said document at said imaging plane.

Re. 31,500

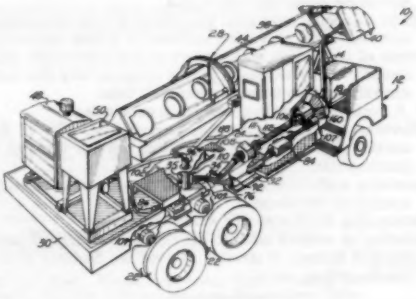
MATERIAL-HANDLING VEHICLE

Keith E. Brownfield, Lansing, Mich., assignor to The Warner & Swasey Company, Cleveland, Ohio

Original No. 3,599,814, dated Aug. 17, 1971, Ser. No. 834,028, Jun. 17, 1969. Application for reissue Dec. 22, 1980, Ser. No. 218,879

Int. Cl.³ E02F *3/00*

U.S. Cl. 414—718 **3 Claims**



1. A material-handling vehicle comprising a frame, support surface engaging drive means connected with said frame for moving said vehicle relative to a support surface, a main engine mounted on said frame, main drive line means for transmitting power from said main engine to said support surface engaging drive means, said main drive line means including a main transmission assembly which is selectively operable to vary the drive ratio between said main engine and said support surface engaging drive means, a first operator's station mounted on said frame, first control means interconnecting said main engine and said first operator's station for enabling operator at said first operator's station to control the operation of said main engine, said first control means being actuable to operate

said main transmission assembly to vary the drive ratio between said main engine and said support surface engaging drive means, a platform movably mounted on said frame, a material-handling mechanism mounted on said platform for movement therewith relative to said frame, an auxiliary engine mounted on said platform for providing power to operate said material-handling mechanism, a second operator's station mounted on said platform, second control means operatively interconnecting said second operator's station and said material-handling mechanism for enabling an operator at said second operator's station to control the operation of said material-handling mechanism, auxiliary drive line means for operatively interconnecting said auxiliary engine and said main drive line means to transmit power from said auxiliary engine to said main drive line means to thereby effect operation of said support surface engaging drive means, and third control means for enabling an operator at said second operator's station to control the transmission of power by said auxiliary drive line means, said auxiliary drive line means comprising a fluid motor fixedly supported on said frame, coupling means for drivingly connecting said fluid motor to said main transmission assembly to enable said fluid motor to drive said support surface engaging drive means with power transmitted thereto through said main transmission assembly and to enable the drive ratio between said auxiliary engine and said support surface engaging drive means to be varied by operation of said main transmission assembly, pump means mounted on said platform and operatively connected to said auxiliary engine for supplying fluid under pressure, and fluid conduit means for conducting fluid under pressure from said pump means on said platform to said fluid motor on said frame to operate said fluid motor to effect operation of said main transmission assembly and said support surface engaging drive means to move said vehicle under the control of an operator at said second operator's station, *and, wherein said coupling means is selectively operable to a first condition to operatively connect said auxiliary drive line means to said main transmission assembly and to a second condition to operatively disconnect said auxiliary drive line means from said main transmission assembly, said main drive line means including clutch means which is selectively operable between an engaged condition in which said main transmission assembly is operatively connected to said main engine and a disengaged condition in which said main transmission assembly is operatively disconnected from said main engine, and actuator means for operating said coupling means to said first condition and contemporaneously therewith operating said clutch means to said disengaged condition to thereby enable said auxiliary engine to drive said main transmission assembly with said main engine operatively disconnected from said main transmission assembly, said actuator means also being operable to operate said coupling means to said second condition to thereby enable said main engine to drive said main transmission assembly with said axuiliary engine disconnected from said main transmission assembly.*

Re. 31,501

METHOD OF PRODUCING A BINARY CODE AND MEANS FOR USING THE SAME

John L. Lorenzo, Southbury, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Original No. 4,148,434, dated Apr. 10, 1979, Ser. No. 857,303, Dec. 5, 1977. Application for reissue Apr. 9, 1981, Ser. No. 253,421

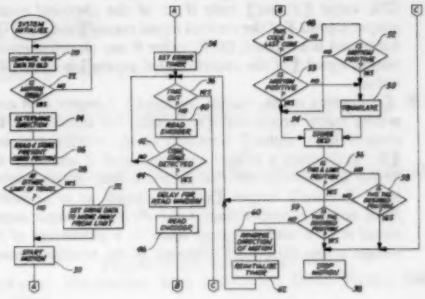
Int. Cl.[3] **G06K** *7/00, 7/08, 7/10, 19/06*

U.S. Cl. 235—435 **14 Claims**

1. In a method of providing digital information in binary code upon an elongated encodable medium, the steps comprising:

(a) encoding said medium by placing on it a plurality of longitudinally spaced combinations of information bits;

(b) displacing said medium in a decoder having means for moving said medium in both longitudinal directions; and



(c) assigning to said combinations a value dependent upon the direction of motion of said medium.

Re. 31,502

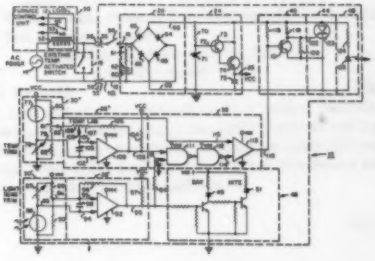
IN-LINE ENERGIZATION AND DE-ENERGIZATION OF AN EXTERNAL LOAD IN SERIES WITH AN EXTERNAL SOURCE OF ELECTRICITY IN RESPONSE TO EXTERNALLY SENSED PARAMETERS

Richard P. Gingras, 40 North St., Ridgefield, Conn. 06877

Original No. 3,974,426, dated Aug. 10, 1976, Ser. No. 575,341, May 7, 1975. Application for reissue Aug. 10, 1978, Ser. No. 932,758

Int. Cl.[3] **H01H** *47/26*

U.S. Cl. 361—170 **25 Claims**



1. A control system for controlling the energization and de-energization of a load in series with a source of alternating current electricity in response to at least two external parameters, comprising:

A. means, (*20*), having input terminals connectable across the load and the alternating current electricity source series combination, for rectifying the alternating current electricity [at] *and applying the rectified alternating current electricity to* a pair of output terminals;

B. means, (*24*), connected to the output terminals of the rectifying means, for voltage regulating a portion of the output of the rectifying means;

C. means, (*30*), connected to the output of voltage regulating means *for sensing external parameters and for* generating [an] electrical [signaling response] *signals, each signal having a magnitude proportional* to *one of the* sensed external parameters;

D. means, (*28*), each connected to one of the sensing means and *to* the voltage regulating means, for generating electrical control output signals that are of a first, ON, value if the sensed parameter is greater than a predetermined value and is a second, OFF, value if the [sense] *sensed* parameter is otherwise;

E. means, (*32*), connected to the output of all the *electrical* control [modules,] *output signal generating means*, for generating a control logic output signal that is of a first, ON, value [if and] only if all of the *electrical control* output signals [of the control signal means] are of an ON value and is a second, OFF, value if any *electrical control* output signal [of the control signal means] is of an OFF value;

F. [triggering means having an input] *a trigger* (*40*) *comprising means* connected [to] *across* the output [of the control logic signal] *terminals of the rectifying* means, [for generating a trigger voltage signal if and only if] *having an output controlled by the output of* the control logic [means] output [signal] *signals, so as to have a fixed nearly ground voltage when the control logic output signal is OFF and a voltage equal to a percentage of the voltage across the output terminals of the rectifying means when the control logic output signal* is [of an] ON [value]; and

G. means, (*44*), having [an] *a gate* input connected to the *output of the* trigger [voltage signal of the triggering means], and connected across the output of the rectifying means, for effectively electrically connecting the input terminals of the rectifying means [if a trigger voltage signal is present] *only after and for the alternating current half cycle when the output of the trigger obtains a predetermined value*, and for effectively disconnecting the input terminals of the rectifying means from each other [if the trigger voltage signal is not present] *at all other times*;

whereby the load is energized by the alternating current electricity source if the sensed external parameters are all greater than their respective selected predetermined values, and the load is de-energized if any of the sensed external parameters are not greater than their respective predetermined values.

PLANT PATENTS

GRANTED JANUARY 17, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,176

MINIATURE ROSE PLANT FLAMEGLO

Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208

Filed May 10, 1982, Ser. No. 376,285
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant of hardy; dwarf; bushy; upright; much branched habit, substantially as illustrated and described, characterized by buds and flowers of medium yellow, with red or pinkish tint or overlay on petal tips as flowers mature, the bud and flower resembling the variety Circus (U.S. Plant Pat. No. 1,382, expired) in color and resembling the variety Over The Rainbow in form and size; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings, with an abundance of small to medium size glossy foliage and an abundance of flowers borne usually singly on sturdy wirey stems.

5,177

ROSE PLANT CV. AROYQUELI

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Sep. 1, 1982, Ser. No. 413,831
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—15 1 Claim

1. A new and distinct variety of rose plant of the hybrid grandiflora class, substantially as herein shown and described, being further especially characterized in that its deep yellow gold coloration lasts well throughout the life of the flower, its vigor and profusion of strong-stemmed flowers, its abundant foliage, its above average hardiness and disease resistance for a yellow rose; its true grandiflora habit; its classically spiraled flower; its abundant production of basal canes and its nearly continual production of flowers throughout the growing season.

5,178

PLUM TREE GAR FANTASY

John M. Garabedian, 3104 Huntington Blvd., Fresno, Calif. 93747

Filed Nov. 22, 1982, Ser. No. 443,336
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree generally characterized by bearing very late ripening, semi-freestone fruit of medium to large size and cordate shape, the flesh of such fruit being yellowish-amber in color and diffused and mottled with red toward the skin, the new variety being particularly characterized as to novelty by bearing fruit ripening approximately two weeks later than fruit of the Roysum variety (U.S. Plant Pat. No. 2,619) and having skin with an extensive and attractive blush of a deeper red to purplish-red than that of the Roysum variety.

5,179

BEGONIA PLANT NAMED BARBARA

Erland V. Schelbeck, Odense, Denmark, assignor to L. Daehnfeldt Ltd., Odense, Denmark

Filed Sep. 20, 1982, Ser. No. 420,498
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct begonia cultivar named Barbara, as described and illustrated, and particularly characterized by its vigorous, compact growth habit; bright pink tepals that maintain color even under high light conditions; floriferous habit, and by its excellent keeping qualities.

PATENTS

GRANTED JAN. 17, 1984

ERRATA

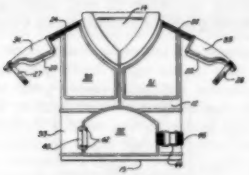
For CLASS	See PATENT NO.
206–526	4,426,035
502–169	4,426,314
502–113	4,426,315
502–169	4,426,316
502–120	4,426,317
502–154	4,426,318
502–241	4,426,319
502–313	4,426,320
381–041	4,426,551
381–071	4,426,552
322–045	4,426,701

PATENTS

GRANTED JANUARY 17, 1984

GENERAL AND MECHANICAL

4,425,667
PROTECTIVE VEST APPARATUS
James M. Harrison, Westwego, La., assignor to Extra Technical Services, Spring, Tex.
Filed Feb. 22, 1982, Ser. No. 351,108
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **10 Claims**



1. A protective vest to protect the user from traumatic blows and thrusts from sharp objects to the upper body and stomach area, comprising:

a. an inner body formed of a bendable foamed material extending from the lower neck to the waist of the wearer and encircling the torso, the vest providing a single front vertical opening communicating with an opening for the wearer's neck, and two openings for the wearer's arms spaced laterally from the neck opening;

b. at least one first hardened armor plate panel affixed to the vest body outer surface and covering at least the upper chest, shoulders, and upper back portions of the vest body;

c. at least one second hardened armor plate panel affixed to the vest body outer surface below and spaced from the first armor plate panel and extending substantially around the vest body terminating circumferentially at the vertical opening and located below the first panel upper plates and at the lower edge of the vest body so that the second panel protects the lower back and stomach areas and can flex relative to the first panel in response to movement of the wearer's body; and

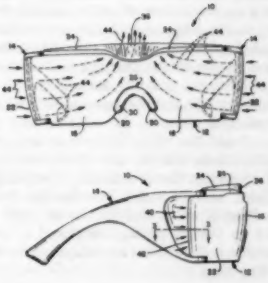
d. armored closure means extending across at least the lower portion of the vertical opening for holding the vest in a closed position, and protecting the stomach area from sharp objects penetrating the vertical opening, the closure means being releasably connected to the vest on at least one side of the vertical opening.

4,425,668
THUMBLESS BOXING GLOVES
Ko Wen-Jen, No. 27 Shin Shen Rd. Chao Chou, Pingtung, Taiwan, and Ko Wen-hsiung, No. 735 Kupulau St., Hilo, Hi. 96720
Filed Dec. 31, 1981, Ser. No. 336,040
Int. Cl.³ A41D *13/08*
U.S. Cl. 2—18 **1 Claim**

1. A thumbless boxing glove consisting of an outer leather cover, an inner leather cover and a ribbon: the inner leather cover, padded with sponge rubber of suitable thickness and softness, having a section for the thumb, a section for the other four fingers, and a section for the wrist and the arm, formed according to the fist and arm shape; the outer cover almost shaped the same as the inner cover, carrying a supplementary layer of sponge on between the sections of the inner cover for the thumb and the other four fingers; a ribbon being inserted through the holes on both sides of a gap cut in the middle part

below the palm, in order to tighten or relax the gap for wearing or removing.

4,425,669
SAFETY GOGGLE
Clark L. Grendol, Sturbridge, Mass., and Richard H. Seager, Mystic, Conn., assignors to American Optical Corporation, Southbridge, Mass.
Filed Feb. 8, 1982, Ser. No. 346,450
Int. Cl.³ A61F *9/02*
U.S. Cl. 2—436 **5 Claims**

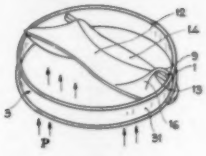


1. A safety goggle comprising the combination of a one-piece wrap-around front having endpieces extending beyond portions of extreme peripheral vision of a wearer of the goggle, a rearwardly extending temple pivotally attached to each of said endpieces and each temple having an outer air scoop adjacent its connection to a respective endpiece, said air scoop providing an elongated generally vertically oriented air inlet for ventilating the space between a goggle wearer's face and said goggle front, said inlet being a passage oriented towards said space between the goggle wearer's face and said goggle front, and said front including a rearwardly directed brow portion with nasal area relief affording air exiting space for effecting said goggle front ventilation.

4,425,670
CARDIAC VALVULAR PROSTHESIS WITH RHEODYNAMIC DISC

Diego Figuera, Madrid, Spain, assignor to Datascope Corporation, Oakland, N.J.

Filed Jul. 15, 1981, Ser. No. 283,562
Claims priority, application Spain, Jun. 4, 1981, 502787
Int. Cl.³ A61F 1/22
U.S. Cl. 3—1.5 16 Claims



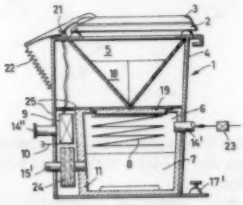
1. A cardiac valvular prosthesis comprising an occluder disc, a supporting ring pivotally supporting said disc, and a suturing ring arranged on an outer portion of said supporting ring and adapted to facilitate suturing to the annulus of a cardiac valve to be replaced, said occluder disc having a hydrodynamic shape, an eccentrically positioned rotational axis far from the obturation plane of the disc, and hinges located in the central area of said disc, said occluder disc being formed with a closing side and an opening side, said closing side comprising two joining protuberances each having a cavity in its outer side of a shape which is slightly less than a quarter of a circle and arranged such that the vertex thereof is as far from the obturation plane as possible, said cavities defining an eccentrically positioned rotational axis, said closing side further comprising a chord determined by said protuberances and dividing said disc into unequal major and minor segments, said major segment progressively diminishing in thickness between said opening side and said closing side from a principal plane defined by said chord and containing said rotational axis to the periphery of said disc and having a concave surface with a substantial concavity in the direction of said principal plane and a less substantial concavity in the direction perpendicular to said principal plane, and two triangularly shaped inclined planes having one side curved and extending from said concave surface to the edge of said disc and continuing toward said principal plane and terminating in said cavities such that a flow of blood can be driven through said cavities, said minor segment also having a concave surface with a thickness between said closing side and said opening side which diminishes from said principal plane to the edge of said disc, and said opening side of said disc being opposite to said closing side and saddle-shaped, concave in the direction of said principal plane and slightly convex or flat in a direction perpendicular to said principal plane, said occluder disc further being pivotable between an open position disposed at an angle which is 90° with respect to the supporting ring and a closed position wherein said disc is disposed at an oblique angle with respect to said supporting ring.

4,425,671
ELECTRICAL COMBUSTION TOILET

Ewald Nelken, Elbestr. 21, 4330 Mülheim (Ruhr), Fed. Rep. of Germany

Filed Apr. 10, 1981, Ser. No. 253,059
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 3014244; Nov. 25, 1980, 3044377
Int. Cl.³ A47K 11/02
U.S. Cl. 4—111.3 1 Claim

1. An electrical combustion toilet comprising a housing having a seat and a cover for said seat, a first receiving chamber for receiving therein toilet wastes, a combustion chamber situated below said first receiving chamber adapted to receive wastes from said first receiving chamber by force of gravity and to electrically incinerate said wastes, an ash chamber for receiving combustion residue from said combustion chamber, a fireproof cover adapted to seal said combustion chamber, encapsulation means enclosing said combustion chamber and said ash chamber supplied with pressurized air for rendering said toilet firedamp-proof, said combustion chamber and said ash chamber being constructed in such a way as to be permeable by pressurized air by means of a pressurized air inlet line and a pressurized air outlet line, said pressurized air inlet line feeding an approximately circular flushing tube having pressurized air outflow openings for flushing air arranged in said combustion chamber, said toilet further comprising switching means for starting activation of said electrical combustion toilet and for starting flow of pressurized air therein, means for

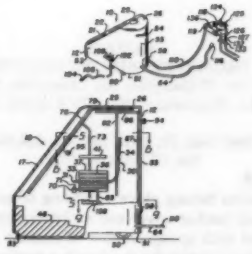


effecting limited-time flushing of said combustion chamber and of said ash chamber by means of said pressurized air through said circular flushing tube, means for opening said combustion chamber cover and for simultaneously effecting dropping of waste matter into said combustion chamber with subsequent closing of said cover, means for effecting renewed time-limited pressurized air flushing, means for switching on activation of heating elements in said combustion chamber and for time-limited activation of said heating elements under slight excess pressure by maintaining a passage of flushing air, means for switching off said heating elements, means for time-limited after-flushing by means of pressurized air, means for time-limited blowing-out of ash from said ash chamber by means of pressurized air and means for switching off said pressurized air.

4,425,672
SHOWER BATH UNITS

Raymond Johnson, 1218 Haywood Ave., West Vancouver, British Columbia, Canada V7T 1V1, and Ronald W. Kenny, 1510 955 Marine Dr., West Vancouver, British Columbia, Canada V7T 1A9

Continuation of Ser. No. 964,367, Dec. 20, 1978, abandoned.
This application Apr. 23, 1981, Ser. No. 256,907
Int. Cl.³ A47K 3/22
U.S. Cl. 4—596 15 Claims



1. A shower bath unit comprising a cabinet having an entrance opening therein, a door for the opening, a clamping latch for the door, sealing means around the perimeter of the

door to seal the entrance opening when the door is retained in the closed position by the clamping latch, a support in the cabinet for a user of the unit, a relatively small neck opening in the cabinet positioned so that the neck of the user positioned on the support can extend through said neck opening with the cabinet enclosing the body of the user from the neck down, spray means in the cabinet arranged to direct water from different directions over the body of the user, a supply pipe having an end to be connected to a source of temperature-controlled water and an opposite end connected to said spray means, a zone value in said supply pipe, a by-pass pipe having one end connected to the supply pipe and an opposite discharge end, and aquastat operatively connected to the supply pipe to be influenced by water passing therethrough and operatively connected to said zone valve to cause the latter to direct water to the spray means when the temperature of said water is within a predetermined range and to shut off the flow of water to the spray means when the temperature thereof is above a first predetermined upper temperature or below a second, substantially lower predetermined temperature of said temperature range, at which time the water flows through the by-pass pipe, whereby a user is automatically protected from being sprayed with water that is too hot too cold relative to an acceptable bathing range, a control valve operable to start and stop said spray means for removing water from the cabinet after said water has been sprayed over the user.

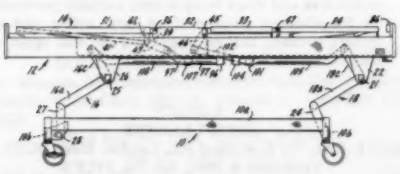
12. A shower bath unit comprising a cabinet having an entrance opening therein, a door for the opening, a latch for the door, a support in the cabinet for a user of the unit, a relatively small neck opening in the cabinet positioned so that the neck of the user positioned on the support can extend through said neck opening with the cabinet enclosing the body of the user from the neck down, spray means in the cabinet arranged to direct water from different directions over the body of the user, pipe means for connecting said spray means to a source of temperature-controlled water, control means connected to said pipe means automatically operable instantly to cause said water to by-pass the spray means when the temperature of the water rises above a first predetermined upper temperature or drops below a second substantially lower predetermined temperature of a predetermined temperature range whereby a user is automatically protected from being sprayed with water that is either too hot or too cold relative to an acceptable bathing range, a control valve at the cabinet operable to start and stop said spray means, and means at the cabinet for removing water from the cabinet after said water has been sprayed over the user.

4,425,673

LIFTING SYSTEM FOR ADJUSTABLE HOSPITAL BED

Lester W. Werner, St. Louis, Mo., assignor to B-W Health Products, Inc., Maryland Heights, Mo.

Filed Dec. 1, 1980, Ser. No. 211,544
Int. Cl.³ A61G 7/00
U.S. Cl. 5—64 **11 Claims**



1. An adjustable hospital bed comprising:
a lower base frame having head and foot ends;
a movable upper frame having head and foot ends;
a head elevating linkage system interconnecting the head ends of said frames and operable to adjustably elevate the upper frame's head end;
a foot elevating linkage system interconnecting the foot ends of said frames and operable to adjustably elevate the upper frame's foot end;
independently rotatable head and foot drive screws mounted one to the side of the other on said upper frame for rotation about parallel axes that are fixed in position with respect to said upper frame;
head drive means threadedly coupled to, and responsive to rotation of, said head drive screw for actuating said head elevating linkage system, rotation in one direction causing the upper frame's head end to raise whereas rotation of said head drive screw in the other direction effects lowering of the upper frame's head end;
foot drive means threadedly coupled to, and responsive to rotation of, said foot drive screw for actuating said foot elevating linkage system, rotation in one direction causing the upper frame's foot end to raise while rotation of said foot drive screw in the other direction effects lowering of the upper frame's foot end;
first means for rotating said head drive screw in a selected one of its two directions, said first means including a first gear that is mounted on and is capable of rotating relative to the head drive screw, and a first clutch for engaging the first gear with the head drive screw, so that the head drive screw will rotate in the direction that the first gear turns;
second means for rotating said foot drive screw in a selected one of its two directions, said second means including a second gear that is mounted on and is capable of rotating relative to the foot drive screw and a second clutch for engaging the second gear with the foot drive screw, so that the foot drive screw will rotate in the direction that the second gear turns;
the first and second gears forming part of a gear train and the first and second clutches being operable independently of each other or jointly;
the direction of the threads on the head and foot screws and the arrangement of the gear train being such that when the head and foot screws rotate in unison, the upper frame will change elevation while maintaining substantially the same angle with respect to the base frame;
and means coupled with the gear train for rotating the first and second gears in either direction of rotation;
said elevating linkage systems thereby being operable independently of each other in order to facilitate positioning of said upper frame at any selected desired height and at any selected desired tilt angle and further being operable simultaneously such that the upper frame changes elevation while maintaining substantially the same angular disposition with respect to the base frame.

4,425,674

TRANSMISSION FOR ADJUSTABLE HOSPITAL BED

Lester W. Werner, St. Louis, Mo., assignor to B-W Health Products, Inc., Maryland Heights, Mo.

Filed Dec. 1, 1980, Ser. No. 211,549
Int. Cl.³ A61G 7/00
U.S. Cl. 5—68 **13 Claims**

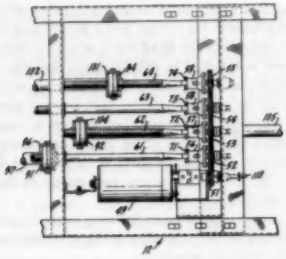
1. An adjustable hospital bed comprising:
a stationary lower base frame;
a movable upper frame having side rails and a cross member connecting the side rails intermediate the ends of the movable frame;
a mattress supporting structure mounted on said upper frame and having independently adjustable back and knee sections;
a high-low lifting system for raising and lowering said upper frame;
a back lifting system for raising and lowering said back section;
a knee lifting system for raising and lowering said knee section;
at least one independently rotatable high-low drive screw mounted on the movable frame for rotation about an axis that is fixed with respect to the movable frame, the screw

being extended to and supported at its one end on the cross member, the screw further being engaged by a nut that is connected to said high-low lifting system for operating said high-low lifting system;

an independently rotatable back drive screw mounted on the movable frame for rotation about an axis that is fixed with respect to the movable frame, the screw being extended to and supported at its one end on the cross member, the screw further being engaged by a nut that is connected to said back lifting system for operating said back lifting system;

an independently rotatable knee drive screw mounted on the movable frame for rotation about an axis that is fixed with respect to the movable frame, the screw being extended to and supported at its one end on the cross member, the screw further being engaged by a nut that is connected to said knee lifting system for operating said knee lifting system;

a spur gear mounted on each drive screw adjacent to the



cross member and being capable of rotating thereon; each spur gear meshing with the spur gear for the drive screw that is adjacent to its drive screw;

a clutch mounted on each drive screw adjacent to the spur gear thereon, with each clutch being shiftable between an engaged condition, wherein it couples the drive screw with its spur gear so that the screw will revolve with the gear, and a disengaged condition wherein the drive screw and spur gear are disconnected and the latter can rotate on the former;

a separate solenoid actuator connected with each clutch for shifting the clutch from its disengaged to its engaged condition when the actuator is energized, each solenoid actuator being capable of being energized independently or along with at least one of the other actuators so that one or more of the drive screws may be coupled to their respective spur gears at the same time; and

an electric motor mounted on the movable frame and being coupled with one of the spur gears for driving all of the spur gears simultaneously.

4,425,675

HEAD REST AND SUNSHADE CONSTRUCTION

Johannes J. A. Victor, P.O. Box 3462, Cape Town 8000, South Africa

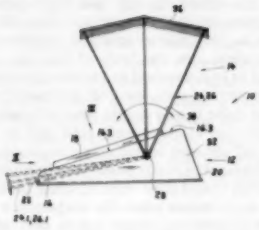
Filed Jun. 30, 1981, Ser. No. 279,172
Int. Cl.³ A47G 9/00
U.S. Cl. 5—440 **6 Claims**

1. A head rest and sunshade construction comprising in combination:

(a) a base consisting of an inclined upper panel having an upper face, and side support panels adapted to support the upper panel on a surface, said side support panels of the base including two longitudinal side panels, a rear panel, a front panel, and a floor panel so that the base constitutes a hollow boxlike configuration;

(b) a cushion member provided on the upper panel so as to project above the upper face of the upper panel;

(c) a sunshade having a support frame and a cover attached thereto; and



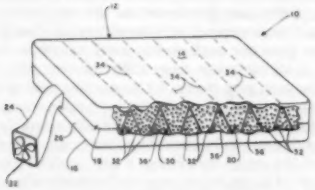
(d) adjustable support means for adjustably supporting the support frame on the base.

4,425,676

CUSHION TO REDUCE THE INCIDENCE OF DECUBITUS ULCERS IN IMMOBILIZED PATIENTS

Robert L. Crane, 200 Lewiston Rd., Kettering, Ohio 45429

Filed Mar. 9, 1982, Ser. No. 356,575
Int. Cl.³ A47C 27/08; A61G 7/04
U.S. Cl. 5—450 **5 Claims**



1. A cushion for reducing the incidence of decubitus ulcers in immobilized patients, comprising:

(a) an enclosure formed by an upper sheet of flexible material permeable to air and a lower sheet of material impermeable to air, said lower sheet being connected at its periphery to the periphery of said upper sheet;

(b) a quantity of loose filler material contained within said enclosure;

(c) means for directing a flow of air into said enclosure; and

(d) a baffle system within said enclosure in the form of a series of strips of material being connected between said upper and lower sheets of said enclosure and arranged generally across the direction of air flow and so as to limit migration of said filler material away from high pressure areas caused by the shape and weight distribution of a patient lying on said upper sheet of said enclosure, said material of said strips being at least partially permeable to air for allowing passage of air flow across said baffle system, through said enclosure and out said upper sheet thereof.

4,425,677

SHOE CLEANER

James P. Cox, 246 E. Bartlett Rd., Lynden, Wash. 98295

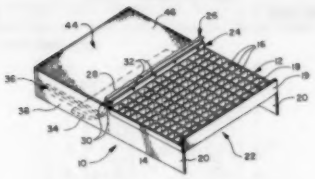
Filed Nov. 6, 1981, Ser. No. 318,870
Int. Cl.³ A47L 23/22
U.S. Cl. 15—104.92 **11 Claims**

1. A shoe cleaner for removing debris from the sole of a shoe, comprising:

(a) foraminous scraper means for contacting the sole of a shoe and, upon relative motion therebetween, removing debris therefrom;

(b) wick means for applying a deodorant and/or solvent for

said debris to said sole, said wick means having a first end disposed in a reservoir for said deodorant and/or solvent and a second application end disposed proximate said foraminous scraper means; and,



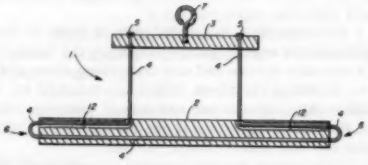
(c) mat means proximate said wick means for removal of any excess deodorant and/or solvent and for secondary removal of debris from said sole, wherein said mat means comprises closure means for said reservoir.

4,425,678

GAME SKINNING AID

Tony P. Pepper, Rte. 1, Box 237-E, Simsboro, La. 71275

Filed Feb. 25, 1982, Ser. No. 352,181
Int. Cl.³ A22B 5/00
U.S. Cl. 17—44.2 **5 Claims**



1. A game skinning aid for suspending animal carcasses comprising an elongated cable bar; a pair of cable guides extending from each end of said cable bar to points intermediate the ends of said cable bar, respectively; a cable extending through said cable guides and into said cable bar to define cable loops in said cable at said ends of said cable bar; a lock bar slidably disposed on said cable in spaced relationship with respect to said cable bar; and a cable slide slidably disposed on said cable above said lock bar to create a support loop in said cable.

4,425,679

BOUTONNIERE ATTACHING PIN

Junko Rizzutto, 5315 Raymond Telles, El Paso, Tex. 85224, and Timothy E. McGlew, 2801 N. Dakota St., Chandler, Ariz. 85224

Filed Aug. 30, 1982, Ser. No. 412,516
Int. Cl.³ A45F 5/08
U.S. Cl. 24—6 **1 Claim**

1. A method for mounting any of a variety of sizes of stem-supported boutonnieres upon a supporting surface, comprising the steps of:

forming a spine with at least three parallel pins projecting in a common direction from said spine;

providing differing distances between adjacent pairs of said pins;

forking said stem between the pair of said pins having the distance therebetween most closely corresponding to the size of said stem; and

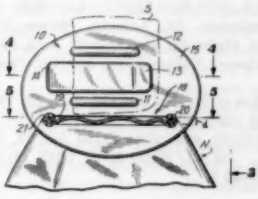
pinning said pins to said supporting surface so that said stem is trapped thereby against said surface.

4,425,680

NAPKIN CLIP

Harold Basseches, 618 N. Glenwood St., Allentown, Pa. 18104, and Donald R. Oswald, 24 Trexler Rd., Schnecksville, Pa. 18078

Filed May 7, 1982, Ser. No. 376,026
Int. Cl.³ A45F 5/04
U.S. Cl. 24—7 **2 Claims**



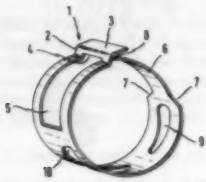
1. A novelty device comprising a napkin clip integrally formed of rigid resilient polymeric material having a front face and a rear face generally parallel thereto, attachment means on said rear face for securing said clip to the clothing of the wearer, said attachment means comprising a finger member spaced from and generally parallel to said rear face and a pair of ribs extending rearwardly from said rear face at positions respectively immediately above and below the upper and lower edges of said finger member, a slot formed through said body portion adjacent the lower end thereof and extending generally parallel to said finger member, said slot having a transverse dimension slightly greater than the thickness of a napkin to be used therewith, the distal ends of said slot being defined by generally circlar enlargement portions, the diameter of said enlargement portions being a multiple of said transverse dimension whereby a napkin corner inserted through said slot and advanced in a direction from said front to said rear face is supported generally flatwise in the area between said enlargement portions and is caused to bunch or convolute in said enlargement portions responsive to the width of the napkin passed through said slot exceeding the spacing of said enlargement portions, the combination including an indicia receiving area on said front face of said body portion in the area above said slot.

4,425,681

CLAMP CONSISTING OF A STEEL BAND LOOP

Siegfried K. Ilius, Carolus-Magnus-Str. 28, D-3538 Marsberg 1, Fed. Rep. of Germany

Filed Oct. 26, 1981, Ser. No. 314,884
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3041106
Int. Cl.³ B65D 63/02; F16L 33/22
U.S. Cl. 24—20 S 5 Claims



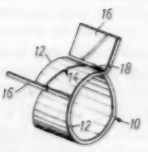
1. In a clamp constructed in the form of a closed band loop having a prestressed closure position wherein the respective ends of said closed band loop become engaged, the improvement comprising one of said ends having an approximately radially extending offset portion joined to an approximately tangentially extending end portion; a circumferential slot opening extending partially around said loop proximate said one end, said slot terminating in said radially extending offset portion; said other end of said loop having a narrowed portion sized for fitting in circumferential relationship in said slot beneath said tangentially extending end portion.

4,425,682

CLAMP FOR HOSES AND THE LIKE

Seiichi Hashimoto, 51, 4-chome, Nagata-Higashi, Higashi-Osaka-shi, Osaka-Fu, and Takaaki Aoki, Tamachashi-Bldg., 3-36, 4-chome, Nakanoshima, Kita-Ku, Osaka-shi, both of Japan

Continuation of Ser. No. 206,578, Nov. 13, 1980, abandoned. This application Jun. 3, 1983, Ser. No. 499,423
Claims priority, application Japan, Jul. 19, 1980, 55-98920
Int. Cl.³ B65D 63/04; F16L 33/02
U.S. Cl. 24—20 S 3 Claims



1. A clamp of a spring metal strip of uniform thickness having a center line, two intermediate portions and two end portions, each of said end portions being integral with one of said intermediate portions,

wherein each of said intermediate portions has a first edge parallel to said center line and a second edge at an angle to said center line such that the second edge crosses said center line, and

wherein said strip including said intermediate portions forms a circular portion so that said end portions extend outwardly from the circular portion, with at least a portion of one of said second edges facing the other second edge,

thereby providing a uniform bending stress in said circular portion of said clamp;

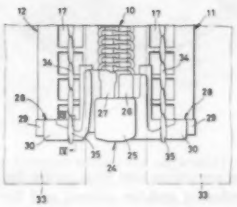
whereby when said clamp is deformed to expand said circular portion, said expanded portion remains circular.

4,425,683

SEPARABLE SLIDE FASTENER

Masahiko Hata, Tokyo, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,429
Int. Cl.³ A44B 19/24
U.S. Cl. 24—381 4 Claims



1. A separable slide fastener comprising:

(a) a pair of warp-knit stringer tapes each including a pair of first and second webs with a wale-free region extending longitudinally therebetween, and a connector thread interconnecting said first and second webs transversely across said wale-free region at longitudinal intervals, said stringer tapes being juxtaposed with said second webs disposed adjacent to each other, said wale-free region being receptive of a chain of thread loops for connecting said stringer tape to a fabric;

(b) a pair of rows of coupling elements each mounted on said second web of one of said stringer tapes remotely from said wale-free region;

(c) a slider movable along said pair of rows of coupling elements for engaging and disengaging the latter;

(d) a separable bottom end stop comprising a box and a box pin extending therefrom, which are mounted on one of said stringer tapes at one end thereof, and a pin mounted on the other stringer tape at one end thereof and insertable into said box; and

(e) a reinforcement member mounted on each of said stringer tapes at said one end thereof and connected to said separable bottom end stop and extending between said first and second webs across said wale-free region, said reinforcement member including a body disposed around said one end of the stringer tape and extending transversely of said stringer tape, said body comprising a pair of opposite surfaces disposed one on each side of said stringer tape and diverging progressively away from each other such that said body increases progressively in cross section away from said separable bottom end stop, said body being engageable with an end of the chain of thread loops.

4,425,684

SEPARABLE SLIDE FASTENER

Shunji Akashi, Kurobe, and Yoshio Matsuda, Nyuzen, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,430
Claims priority, application Japan, Oct. 15, 1980, 55-146596
Int. Cl.³ A44B 19/24
U.S. Cl. 24—434 1 Claim

1. A separable slide fastener comprising:

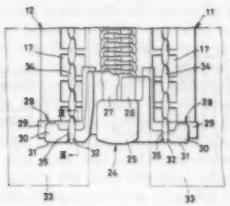
(a) a pair of warp-knit stringer tapes each including a pair of first and second webs with a wale-free region extending longitudinally therebetween, and a connector thread interconnecting said first and second webs transversely across said wale-free region at longitudinal intervals, said stringer tapes being juxtaposed with said second webs disposed adjacent to each other, said wale-free region being receptive of a chain of thread loops for connecting said stringer tape to a fabric;

(b) a pair of rows of coupling elements each mounted on said

second web of one of said stringer tapes remotely from said wale-free region;

(c) a slider movable along said pair of rows of coupling elements for engaging and disengaging the latter;

(d) a separable bottom end stop comprising a box and a box pin extending therefrom, which are mounted on one of said stringer tapes at one end thereof, and a pin mounted on the other stringer tape at one end thereof and insertable into said box; and



(e) a reinforcement member mounted on each of said stringer tapes at said one end thereof and connected to said separable bottom end stop and extending between said first and second webs across said wale-free region, said reinforcement member including a body disposed around said one end of the stringer tape and extending transversely of said stringer tape, said body having a recess opening away from said stringer tape for receiving therein an end of the chain of thread loops.

4,425,685

SEPARABLE SLIDE FASTENER

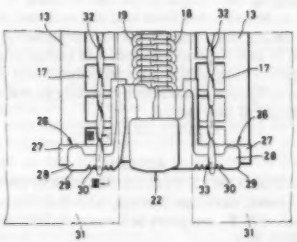
Toru Ogihara, Funabashi, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,431

Claims priority, application Japan, Oct. 15, 1980, 55-146595[U]

Int. Cl.³ A44B *19/24*

U.S. Cl. 24—434 **5 Claims**



1. A separable slide fastener comprising:

(a) a pair of warp-knit stringer tapes each including a pair of first and second webs with a wale-free region extending longitudinally therebetween, and a connector thread interconnecting said first and second webs transversely across said wale-free region at longitudinal intervals, said stringer tapes being juxtaposed with said second webs disposed adjacent to each other, said wale-free region being receptive of a chain of thread loops for connecting said stringer tape to a fabric;

(b) a pair of rows of coupling elements each mounted on said second web of one of said stringer tapes remotely from said wale-free region;

(c) a slider movable along said pair of rows of coupling elements for engaging and disengaging the latter;

(d) a separable bottom end stop comprising a box and a box pin extending therefrom, which are mounted on one of said stringer tapes at one end thereof, and a pin mounted on the other stringer tape at one end thereof and insertable into said box; and

(e) a reinforcement member mounted on each of said stringer tapes at said one end thereof and connected to said separable bottom end stop and extending between said first and second webs across said wale-free region, said reinforcement member including a roughened surface coextensive substantially widthwise with said wale-free region for engagement with an end of the chain of thread loops of said reinforcement member against displacement thereof.

4,425,686

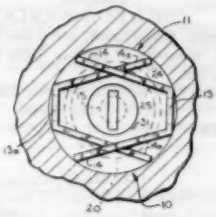
TELESCOPING FASTENER

Alexander W. Schenck, 2991 Chapshire Dr., SE., Grand Rapids, Mich. 49506

Filed Jun. 9, 1980, Ser. No. 157,888

Int. Cl.³ A44B *17/00*

U.S. Cl. 24—604 **6 Claims**



1. A fastener for interconnecting a pair of elements, said fastener having a male portion and a female portion, said female portion having a base and a plurality of upstanding arms integral with the base and extending normal thereto and sized to frictionally and radially engage the sides of a cylindrical recess provided in the face of one of said elements, each of said arms having a plurality of protrusions arranged crosswise of said arms, the protrusions being spaced along said arms, the protrusions of one arm extending toward the protrusions of the other of said arms, said male portion secured to the other of said elements and sized to seat telescopically between said arms in a selected friction fit, said protrusions of one arm also extending past the protrusions of the other arm whereby the ends of said protrusions thrust against said cylindrical recess and applying a radial force normal to the axis of said male portion thereof and holding said portions together.

4,425,687

SAFETY CLASP FOR JEWELRY

Alfred E. Sauer, Warwick, R.I., assignor to B. A. Ballou & Co., Incorporated, Providence, R.I.

Filed Nov. 5, 1980, Ser. No. 204,389

Int. Cl.³ A44B *11/26*

U.S. Cl. 24—664 **4 Claims**

3. A safety clasp for jewelry comprising a hollow circular shaped casing (generally circular in one dimension and generally flat in an opposition dimension) having a flat top and bottom, said casing having an inner wall and a first notch opening, and a second notch opening, a spring lock release fabricated from flat resilient material and having a tab located within said hollow casing, a tongue guide fabricated from flat material, positioned upon said spring lock release within said casing and provided with a slot and a guideway, said tab slidably mounted in said slot, a tongue, having a step fabricated from flat stock and slidable in said guideway with said step engageable and disengageable with said tab, means for manually moving said spring lock release back and forth in said

casing through said second notch opening, a second manual means for moving said tongue back and forth in said casing

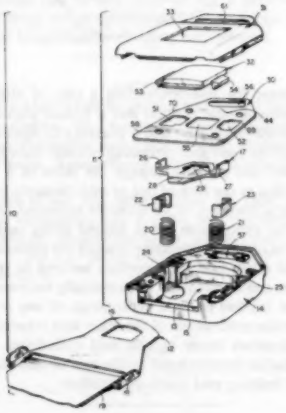
through said first notch opening, (and a third) fastening means for attaching a jewelry chain to said casing.

4,425,688

CHILD BELT BUCKLE

James R. Anthony, Indianapolis, and Allan R. Lortz, Carmel, both of Ind., assignors to Indiana Mills & Manufacturing, Inc., Carmel, Ind.

Filed Nov. 6, 1981, Ser. No. 318,757
Int. Cl.³ A44B *19/00*
U.S. Cl. 24—656 14 Claims



1. A buckle comprising:

a reinforcement plate;

a main body having said plate mounted thereto, said main body includes yieldable means integral therewith for engaging said plate, said yieldable means being movable to allow said plate to be inserted in said main body and then movable back holding said plate therein;

a latch positioned in said main body and held captive therein by said plate, said latch movable between a latch position and an unlatched position;

spring means contacting said latch to move said latch back and forth between said latch position and said unlatched position;

operator means operable to move said latch to said unlatching position; and

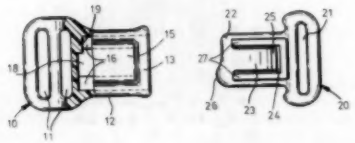
a cover mounted to said main body and enclosing said latch, said spring means and said plate, said cover including locking means engaging said plate securing said cover to said main body.

4,425,689

SEPARABLE FASTENER FOR GARMENTS, BELTS AND THE LIKE

Gerhard Fildan, Dieselstr. 20, 7250 Leonberg, Fed. Rep. of Germany

Filed Apr. 9, 1982, Ser. No. 367,026
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1981, 8120432[U]
Int. Cl.³ A44B *11/26*
U.S. Cl. 24—664 6 Claims



1. In a fastener for a piece of apparel, comprising a male portion and a female portion of resilient plastic material, each of said portions being provided with strap-engaging means, said female portion forming a guide channel bounded by a substantially rectangular frame with a cross-member remote from the strap-engaging means thereof having a slot registering with said channel, said male portion being provided with a flat shank insertable through said slot into said channel, said male portion further having a tongue attached to a leading end of said shank and extending rearwardly therefrom in a cutout of said shank while resiliently projecting from said cutout and terminating in a free edge engageable with a shoulder of said cross-member in a locking position of the fully inserted shank for preventing a spontaneous separation of said portions from each other,

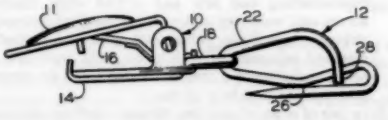
the improvement wherein said female portion is provided with a resilient tab extending codirectionally with said tongue toward said cross-member within said frame and overlying said tongue in the locking position of said male portion, said tab normally being substantially flush with said frame and inwardly deflectable by finger pressure for disengaging said tongue from said shoulder to enable said shank to be extracted from said channel, said tab having a recess facing said channel and accommodating part of said tongue in said locking position, said recess being bounded by a pair of ridges flanking said tongue, said ridges limiting the deflection of said tab by coming to rest on rabbeted boundaries of said cutout.

4,425,690

AUTOMOBILE FLOOR MAT FASTENER

James Y. Fraser, Saratoga Springs, and Bob Bailey, Ballston Lake, both of N.Y., assignors to Racemark International, Inc., Burnt Hills, N.Y.

Filed May 4, 1981, Ser. No. 260,362
Int. Cl.³ A44B *9/00*
U.S. Cl. 24—351 19 Claims



1. An automobile floor mat fastener for anchoring a mat at its rearward-facing edge to an automobile carpet comprising:

a clip having jaws at one end operable between an open

position defining an opening and a closed position for engaging the rearward-facing edge of the mat to be anchored and having a linking end opposite said jaws;

a hook having a linking end and a hook end opposite said linking end; and

linkage means connecting said clip and said hook at their respective ends in an aligned position while permitting independent lateral and longitudinal movement by the clip with respect to the hook without the hook becoming unlinked from the clip, whereby the connection between said clip and said hook ends will normally maintain them in an aligned position during use, said hook having a portion extending from the linking end to the hook end and turning back toward the linking end forming said hook and terminating in an open-ended pin portion adapted to be inserted into the carpet so as to point forwardly of the automobile toward the mat engaged by the clip and anchor the fastener to the carpet, said opening defined by said jaws and said open-ended pin portion facing substantially the same direction when said clip and hook are in the aligned position, whereby a force tending to pull said mat from said jaws along the aligned position will pull the hook in its hooked direction and thereby prevent disengagement of the fastener.

4,425,691

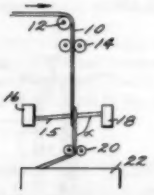
FABRIC FORMING PROCESS

Stanley Backer, 5 Irving Rd., Waban, Mass. 02168, and Michael A. Zimmerman, 42 Strathmore Rd., A6, Brookline, Mass. 02146

Filed Apr. 30, 1982, Ser. No. 373,737

Int. Cl.³ D04B *35/00*; D03B *49/00*

U.S. Cl. 28—166 **10 Claims**



1. In a fabric forming process of the type including a fabric forming device and means for feeding at least one end of yarn to the device, the method comprising the steps of:

(a) wrapping the yarn about a pin means which intersects the yarn path upstream of the fabric forming device;

(b) moving the pin means while the yarn is passing therearound so that the angle of intersection of the pin means and yarn path is varied whereby twist accumulated in the yarn upstream of the pin means is permitted to pass the pin means, and

(c) incorporating the yarn in a fabric with portions of the length of yarn retaining at least some of the twist that has passed the pin means.

4,425,692

GLOW PLUG FOR USE IN DIESEL ENGINE AND METHOD OF MANUFACTURING THE SAME

Sokichi Minegishi; Tozo Takizawa, both of Higashimatsuyama, and Morimasa Furusawa, Kumagaya, all of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

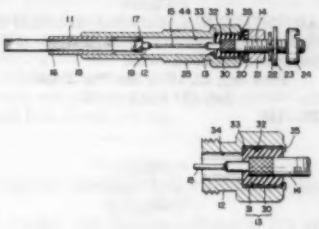
Filed Feb. 19, 1982, Ser. No. 350,211

Claims priority, application Japan, Mar. 27, 1981, 56-42240[U]

Int. Cl.³ H01C *17/02*

U.S. Cl. 29—611 **10 Claims**

1. The method of manufacturing a glow plug for use in a diesel engine of the kind comprising a hollow holder, at one end of which is supported a heating element with one end sealed within the holder and the other end extending therefrom and at the other end of which is supported a terminal element with one end sealed in the holder and the other end extending therefrom and wherein the inner ends of the heating element and terminal element are electrically connected, the method for sealing the terminal element in the holder comprising positioning an electric insulator about that portion of the terminal element within the holder and a metal sleeve about the insulator, supporting the inner end of the sleeve and insulator against axial movement and applying axial compression to the outer ends of the sleeve and insulator confined within the holder and constrained from axial movement to contract the insulator about said terminal portion within the holder.



4,425,693

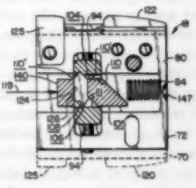
RETRACTABLE KNIFE FOR SKIVING TOOL

Lawrence C. Dickinson, 2255 Eva Adams, Reno, Nev. 89504

Continuation-in-part of Ser. No. 205,026, Nov. 7, 1980, Pat. No. 4,380,851, and Ser. No. 183,664, Sep. 2, 1980, Pat. No. 4,367,576. This application Sep. 14, 1981, Ser. No. 301,503

Int. Cl.³ B24B *39/00*

U.S. Cl. 29—90 R **12 Claims**



1. A retractable knife for rotary skiving operations comprising:

a pair of knife means extending in opposite directions from the axis of rotation each including knife blade holders slideable relative to one another and having confronting camming surfaces, the camming surfaces of at least one of the holders including a first portion inclined at an acute angle to the axis of rotation and a second portion parallel to the axis of rotation, the other holder having a camming surface parallel to the axis of rotation;

a push dart having camming surfaces engageable with the camming surfaces of the holders, said push dart being movable from a first position in engagement with the inclined first portion of the camming surfaces of at least one of the holders and the camming surfaces of the other holder, and a second position in engagement with the parallel camming surfaces of both of the holders;

means for moving the push dart from the first position to the second position, movement of the push dart from the first position to an intermediate position causing the holders to slide radially outwardly relative to one another and movement of the push dart from the intermediate position to the

second position locking the holders in place relative to one another in their outwardly extended position; and

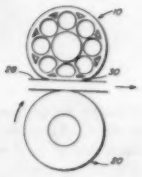
means for returning the push dart from the second position to the first position to unlock the holders relative to one another and including cam means to cause them to slide radially inwardly relative to one another.

4,425,694

SELF-ADJUSTING ROLLER AND METHOD OF USE

Richard C. Somerville, Duxbury, Mass., assignor to Globe Rubber Works, Inc., Rockland, Mass.

Filed Sep. 22, 1981, Ser. No. 304,637
Int. Cl.³ B21B *27/02*
U.S. Cl. 29—110 **18 Claims**



1. A self-adjusting resilient roller, which roller comprises a cylindrical roller formed of a resilient material and having a peripheral outer surface, the roller characterized by:

(a) a central axial passageway, which passageway is adapted to receive a shaft therein about which the roller may revolve;

(b) a plurality of generally smaller-sized spaced-apart and generally circular openings extending axially through the roller, and positioned generally uniformly about the central axial passageway; and

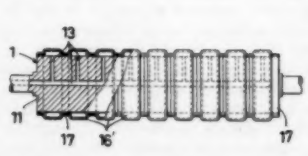
(c) a plurality of generally uniformly shaped peripheral openings, the openings smaller than the circular openings and extending axially through the roller, each opening positioned toward the outer peripheral surface of the roller and between the adjacent circular openings, to provide, with the axial passageway, a generally uniform wall thickness of resilient material about the circular openings, thereby providing a self-adjusting resilient roller of substantially uniform resiliency, so that the roller will conform to various thicknesses of sheet material in contact with the roller, without substantial deformation of that portion of the roller out of contact with the sheet material.

4,425,695

ROLLS FOR USE IN CORRUGATED FIBREBOARD PRODUCTION SYSTEM

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Kabushiki Kaisha (Rengo Co., Ltd.), Osaka, Japan

Continuation-in-part of Ser. No. 111,476, Jan. 7, 1980, abandoned. This application Apr. 9, 1981, Ser. No. 252,607
Claims priority, application Japan, 1; Jan. 16, 1979, 54-3759; Apr. 13, 1979, 54-45577 May 29, 1980, 55-74839[U]
Int. Cl.³ B21B *27/02*
U.S. Cl. 29—113 R **13 Claims**



1. A flexible roll for use in pressing toward a web of corrugated fibreboard during the production thereof, said roll comprising:

a cylindrical roll body having an outer surface;

a plurality of flexible tubular sheets positioned about said outer surface of said roll body and arranged axially of each other along said roll body, each said tubular sheet having opposite axial ends;

means for fastening and sealing said opposite axial ends of said tubular sheets to said outer surface of said roll body, and thereby for defining between said outer surface of said roll body and the inner surface of each said tubular sheet a space;

each said space being inflated with a gas, thereby expanding outwardly the respective said tubular sheet between said opposite ends thereof;

each said outwardly expanded tubular sheet having an uncovered outer surface, said outer surfaces of said plurality of tubular sheets defining a radially elastic outer periphery of said roll; and

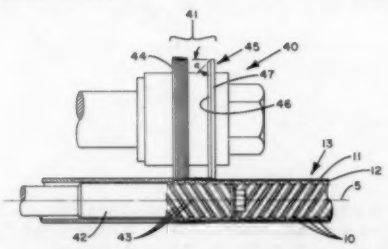
each pair of axially adjacent said outwardly expanded tubular sheets defining between adjacent end portions thereof an annular radial gap, each said gap being filled substantially by an elastic annular spacer member.

4,425,696

METHOD OF MANUFACTURING A HIGH PERFORMANCE HEAT TRANSFER TUBE

Matti J. Tornialnen, Chittenango, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 2, 1981, Ser. No. 280,025
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.3 AH **4 Claims**



1. A method of making an internally ribbed and externally finned heat transfer tube from an unformed tube which comprises the steps of:

positioning the unformed tube on a mandrel, said mandrel having at least one helically extending depression on its surface;

displacing the tube wall of the unformed tube by rolling discs over the exterior surface of the tube above the mandrel to press the tube against the mandrel to form at least one helically extending rib on the interior surface of the tubing and to form simultaneously at least one helically extending fin convolution extending around the exterior of the tubing, said external fin convolution having depressed sections located above the internal rib; and

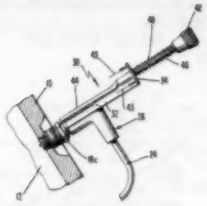
rolling a smooth roller-like disc over the exterior surface of the tube after the external fin convolution and internal rib are formed to bend over the tip portion of the external fin convolution to touch the adjacent convolution at the non-depressed sections of the fin convolution to form subsurface passages which communicate with the surroundings of the tube through openings located at the depressed sections of the fin convolution which are not bent over enough by the smooth disc to touch the adjacent convolution.

4,425,697

SPARK PLUG BOOT REMOVER

George Simmons, Rt. 2 Box 240, Buchanan, Tenn. 38222

Filed Sep. 27, 1982, Ser. No. 424,906
Int. Cl.³ B25B *27/14*
U.S. Cl. 29—280 9 Claims



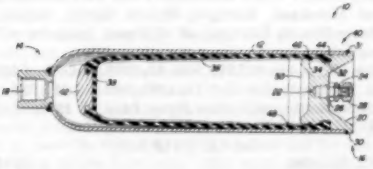
1. An apparatus for removing a spark plug wire boot from a spark plug mounted on an engine head or the like comprising:
(a) a longitudinally extending semi-cylindrical base, said base having a semi-circular lip extending radially inward from its interior surface at a first longitudinal end of the base, said semi-circular lip being adapted to engage the underside of a spark plug boot;
(b) a finger grip extending radially outward from the exterior surface of the base at the other longitudinal end;
(c) a tongue movably secured to said base for longitudinally translatable movement with respect thereto along the base's exterior surface, said tongue being movable from a first position in which the tongue is withdrawn and located along the base to a second position in which the distal end of the tongue extends into engagement with the head; and
(d) handle means secured to said tongue for moving said tongue to the second position and force controlled movement of said base away from said head to thereby remove the boot by pushing engagement of the lip.

4,425,698

METHOD OF ASSEMBLING A PRESSURE VESSEL

Ivan L. Petrie, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 196,898, Oct. 14, 1980, Pat. No. 4,328,836.
This application Jan. 25, 1982, Ser. No. 342,331
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—451 4 Claims



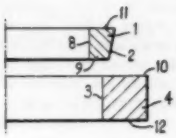
1. A method of assembling a pressure vessel having a rigid cylindrical housing having a closed end and an open end, said closed end having a port provided therein; an end cap having an axially extending through hole provided therein, an annular shoulder encircling the outer periphery thereof, and first and second annular grooves encircling the outer periphery thereof, said first annular groove located between said annular shoulder and said second annular groove; a gas valve; and a generally cylindrical bladder of a resilient deformable material having a closed end and an open end, said open end having an inwardly projecting annular protuberant; said method comprising the steps of:
(a) purging said cylindrical housing to remove contaminants;
(b) positioning an O-ring in said second annular groove in said end cap;
(c) inserting said annular protuberant of said bladder into said first annular groove in said end cap;
(d) inserting said bladder and end cap into said open end of said cylindrical housing;
(e) pressing said bladder end and end cap into said open end of said cylindrical housing until said annular shoulder abuts said open end of said cylindrical housing;
(f) securely fastening by a continuous weld the exterior of the abutting shoulder of said end cap to said open end of said cylindrical housing; and
(g) inserting said gas valve in a blocking position across said through hole in said end cap.

4,425,699

METHOD OF CONNECTING TWO RINGFORMED ELEMENTS

Dag E. V. Nordin, Täby, Sweden, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 951,933, Oct. 16, 1978, abandoned.
This application Jan. 19, 1981, Ser. No. 225,839
Claims priority, application Sweden, Nov. 29, 1977, 7713479
Int. Cl.³ B21D *39/00*; B23P *11/00*
U.S. Cl. 29—505 2 Claims



1. A method of connecting a mechanical seal ring of hard metal, ceramic or the like to a supporting ring of aluminum, stainless steel or some other relatively soft material, comprising the step of pressing the mechanical seal ring against the supporting ring with a power so strong that the material of the supporting ring is elastically and plastically deformed by the mechanical seal ring so that a good connection is obtained, wherein the mechanical seal ring before the pressing has a sealing surface smoother than 10 μm, preferably 1 μm, wherein a press tool is used for pressing said mechanical seal ring against the supporting ring, and wherein the surface of said press tool which presses against said mechanical seal ring is smoother than 10 μm, preferably 1 μm.

4,425,700

SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

Nobuo Sasaki, Kawasaki, and Motoo Nakano, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

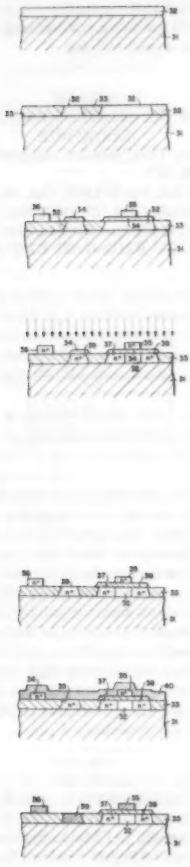
Filed Aug. 7, 1981, Ser. No. 290,972
Claims priority, application Japan, Aug. 13, 1980, 55-111334
Int. Cl.³ H01L *21/86, 21/88*
U.S. Cl. 29—571 8 Claims

1. A method of manufacturing a semiconductor device, comprising the steps of:
(a) forming a single-crystal silicon layer on an insulating substrate;
(b) patterning the single-crystal silicon layer to form an active element region and a first wiring region;
(c) forming a gate insulating film on the active element region and first wiring region;
(d) forming a polycrystalline silicon film over the insulating substrate;
(e) patterning the polycrystalline silicon film to form both a

gate electrode region except over the active element region and a second wiring region;

(f) implanting an impurity by blanket ion implantation into the first wiring region, the second wiring region, the gate electrode region and the active element region under the gate electrode region;

(g) removing the gate insulating film on the first wiring region;



(h) forming a metal layer over the insulating substrate in contact with the first wiring region, the second wiring region and the gate electrode;

(i) annealing the semiconductor device to form metal silicide regions by converting the metal layer in the first wiring region, the second wiring region and the gate electrode region into metal silicide throughout the entire thickness thereof; and

(j) removing the metal layer remaining after the formation of the metal silicide region in the annealing step.

4,425,701

METHODS OF MAKING MAGNETIC RECORDING HEADS

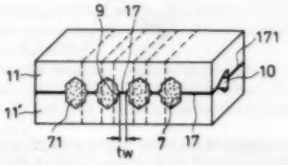
Ken Takahashi, Suita, and Hiroshi Youda, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 9, 1981, Ser. No. 310,114

Claims priority, application Japan, Oct. 17, 1980, 55-146188; May 20, 1981, 56-77218

Int. Cl.³ G11B 5/42

U.S. Cl. 29—603 **22 Claims**



1. A method of making magnetic recording heads having a predetermined track width associated therewith, comprising the steps of:

forming first grooves on a face of a ferromagnetic substrate disposed substantially parallel to each other, spaced apart by a distance wider than said track width, by forming a first mask and a second mask which is broader than said first mask, covers said first mask and is removable separately from said first mask, and carrying out a first etching of said substrate by using said second mask as an etching mask;

subsequently forming by photolithographic etching, second substantially parallel grooves having a depth shallower than that of said first grooves, disposed parallel to and connecting to said first grooves at the edges thereof, by selectively removing said second mask while retaining said first mask, and carrying out a second etching to form said second substantially parallel grooves using said first mask as an etching mask, said second grooves defining track width by the distance inbetween;

cutting the ferromagnetic substrate into a predetermined number of units; and

assembling a core by utilizing at least one of said units.

4,425,702

METHODS OF FABRICATING A MINIATURE HIGH FREQUENCY COIL ASSEMBLY OR TRANSFORMER

Hiromi Murakami, Kawagoe; Masato Suzuki, Sakado, and Tutomu Suzuki, Kawagoe, all of Japan, assignors to Toko, Inc., Tokyo, Japan

Division of Ser. No. 907,576, Feb. 19, 1978, Pat. No. 4,245,207. This application Oct. 10, 1980, Ser. No. 195,929

Claims priority, application Japan, May 20, 1977, 52-63844; Jul. 4, 1977, 52-79655; Jul. 4, 1977, 52-79656

Int. Cl.³ H01F 7/06

U.S. Cl. 29—606 **3 Claims**

1. A method of fabricating a high frequency coil assembly or transformer, comprising the following steps:

preparing a substrate having a plurality of electrodes and having a through bore in its center portion;

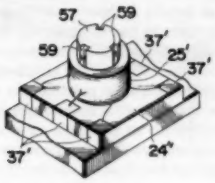
disposing the substrate on a first casting core which has a flat base and a projection projecting perpendicularly from said flat base, the arrangement of the substrate on said casting core being such that said substrate lies on said flat base and said projection extends axially through the bore thereof;

winding a coil around said projection;

disposing an external core member on said substrate circumferentially of said coil, said external core member being

made of a magnetic material and having a through bore therein, the arrangement of said external core member on said substrate being such that the longitudinal axis of said through bore of said external core member is coaxial with the longitudinal axis of said projection and encloses said coil;

disposing a second casting core on said projection such that the axes of said second casting core and said projection are coaxial, said projection being dimensioned such that said



second casting core is partly received in said through bore of said external core member, and said second casting core having a larger diameter than said projection;

casting a settable elastic material into said through bore of said external core member;

removing said first and second casting cores after setting of said elastic material, thereby forming a core-receiving bore in said elastic material; and

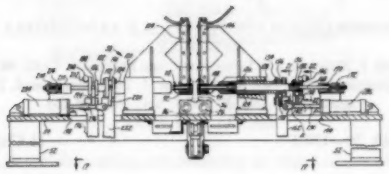
inserting a movable core made of a magnetic material into said core-receiving bore of the elastic casting material.

4,425,703

BEARING ASSEMBLY MACHINE

William E. Rise, Utica, Mich., assignor to Android Corporation, Auburn Heights, Mich.

Filed Oct. 26, 1981, Ser. No. 315,315
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—724 **26 Claims**



1. In a bearing assembly machine for assembling bearing elements into a retainer wherein bearing elements are arranged in a desired array and assembled to the retainer, the machine comprising first holding means for holding a retainer, second holding means for holding the array of bearing elements, and means for advancing one of the two holding means toward the other to assemble the array to the retainer and for retracting the holding means from each other upon completion of the assembly of the array to the retainer, an improved arrangement for advancing and retracting the one holding means comprising means providing a bias force, a coupling mechanism for coupling the bias force to the one holding means such that the bias force causes the one holding means to be urged in the direction of advance toward the other holding means, and control means comprising scheduling means defining a schedule of desired advance and desired retraction for said one holding means, said control means being operatively coupled with the coupling mechanism and acting via the coupling mechanism in opposition to the bias force for controlledly limiting the advance of said one holding means by the bias force in accordance with the desired schedule of advance to bring the array and the retainer into assembly and for counteracting the bias force to retract said one holding means after assembly of the array to the retainer has been completed, said scheduling means being constructed and arranged so as to be incapable of exerting any advancement force via said coupling means on said one holding means, said scheduling means comprising cam means, said cam means comprising a rising cam segment defining the desired schedule of retraction and a falling cam segment defining the desired schedule of advance, said scheduling means also comprising cam follower means which is urged into engagement with said cam means by the bias force such that said cam follower means is caused to follow said rising and falling cam segments, said control means and said coupling means being constructed and arranged such that if during advance an assembly force is encountered which is greater than that which can be developed by the bias force, said follower ceases to follow said falling cam segment.

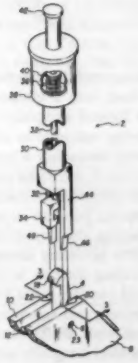
25. In a bearing assembly machine for assembling bearing elements into a retainer wherein bearing elements are arranged in a desired array and assembled to the retainer, the machine comprising first holding means for holding a retainer, second holding means for holding the array of bearing elements, and translating means for advancing one of the two holding means toward the other to assemble the array to the retainer and for retracting the holding means from each other upon completion of the assembly of the array to the retainer, said translating means including twist means for imparting desired twisting rotation to the assembled array via said second holding means, but wherein during retraction the translating means may impart an undesired twisting rotation to the assembled bearing elements via said second holding means, the improvement which comprises first means on said twist means and second means independent of said twist means, said first and second means coacting to be interactive with the translating means, including said twist means, during retraction for counteracting such undesired twisting rotation.

4,425,704

EXTRACTION TOOL FOR ELECTRICAL CONNECTOR LATCH

Charles D. Cline, Dallas, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 3, 1981, Ser. No. 327,004
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—764 **1 Claim**



1. An extraction tool for removing a locking latch from between a pair of channel walls, said latch being pivoted on opposing trunnions inserted in apetures in said walls forming a snap-in socket of an electrical connector housing, said tool comprising:

a tool body;

a fork-like portion at the end of said tool body having a pair of spaced tines with outer tapered camming surfaces insertable between said channel walls toward said apertures to force said channel walls apart and spread said socket beyond the furthermost projection of said trunnions; and

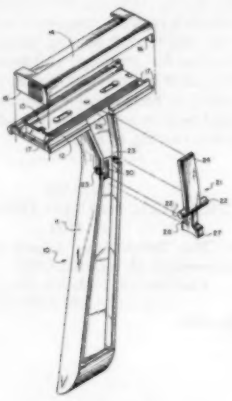
a spring loaded hook extendable along said tool body between said tines to an extended position for engaging and pulling said latch, upon spreading of said socket, to a position such that upon withdrawal of said fork-like portion, said trunnions do not reinsert in said apertures, thereby permitting removal of said latch.

4,425,705

RAZOR WITH LEVER OPERATED BLADE COVER

Evan N. Chen, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 19, 1981, Ser. No. 275,475
Int. Cl.[3] B26B *21/06*
U.S. Cl. 30—84 1 Claim



1. In a disposable razor of the type having a single edge blade consolidated and fixed into a molded plastic assembly supported by a handle formed integrally with said plastic assembly, said handle being susceptible of grasping in one-hand fashion, said assembly including a track and a cover with a skirt slidable on said track in a plane parallel to the plane of the blade from a first position in which said blade edge is covered or enclosed to a second position in which the blade edge is exposed for wet shaving, the improvement comprising:

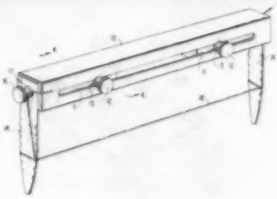
a manually operable actuating means mounted on said handle and cooperating directly with said cover for sliding the cover in said parallel plane from said first position to said second position, said actuating means defining a lever having opposed stub shafts mounted pivotally in said handle, a tab molded integrally with said cover, a first end of said lever on one side of said pivotal mounting being operable to engage directly and make a driving connection with the skirt and the tab, a second end of the lever on the opposite side of the pivotal mounting being operable manually to pivot the lever and thus drive the cover to and fro manipulated by the same hand by which the handle is grasped.

4,425,706

CUTTING TOOL

William W. Southworth, and Elaine D. Southworth, both of 2731 Jolly La., Chester, Va. 23831

Filed Jan. 27, 1982, Ser. No. 343,116
Int. Cl.[3] A21C *5/00*
U.S. Cl. 30—116 4 Claims



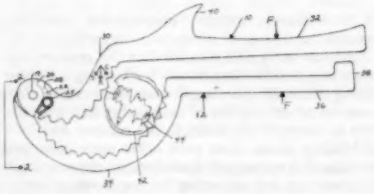
1. A cutting tool for spaceably horizontally and vertically sectioning cakes or other foodstuffs comprising a U shaped handle member open at the bottom, a plurality of blade carriers for insertion in said handle member and for holding individual cutting blades, means for securing said blade carriers in position within said handle member, cutting blades extending vertically from said blade carriers forming a plurality of cutting edges perpendicular to the longitudinal axis of said handle member, said blades having spaced notches on the edges thereof, a removable cutting strand disposable between said cutting blades in said notches forming one or more cutting edges parallel to the longitudinal axis of said handle and means for securing said cutting strand to maintain tension when disposed between the cutting blades, forming a cutting tool which when drawn through a cake or foodstuff simultaneously cuts it into spaced vertical and horizontal sections or with the cutting strand removed cuts the cake or foodstuff into spaced vertical sections.

4,425,707

COMPRESSION TOOL, USEABLE AS NUTSHELL REMOVER

Marvin F. Polsfuss, 676 Silver Ave., San Francisco, Calif. 94134

Continuation of Ser. No. 249,849, Apr. 1, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,261
Int. Cl.[3] A47J *43/26*
U.S. Cl. 30—120.3 11 Claims



1. A tool comprising:

a pair of elongated legs hingedly attached together at one end of each leg by a common hinge,

each leg having a jaw section adjacent said hinge,

the entire length of each jaw section having a roughened, grasping surface facing the jaw section of the other leg,

each leg also having a manual holding section remote from said hinge, whereby any force applied to said manual holding sections will be multiplied at said jaw sections,

said tool being characterized in that:

(1) the entire jaw section of each of said legs is curved, the surface of the entire jaw section of one leg which faces that of the other leg having a concave curvature which is circular in shape, and the surface of the entire jaw section of the other leg which faces said one leg having a convex curvature,

(2) said hinge is oriented away from any center of curvature of either of said jaw sections, and

(3) said jaw sections are shaped and oriented so that:

(a) when any generally spherical workpiece within a predetermined size range is placed at any location within said jaw sections and in contact with both of said jaw sections and said legs are squeezed together, all corresponding portions of said jaw sections will move in a combination of direct motion together and relative sliding motion such that said workpiece will experience a combination of compressive and shear forces from movement of said jaw sections, regardless of the location at which said workpiece is placed within said jaw sections, and

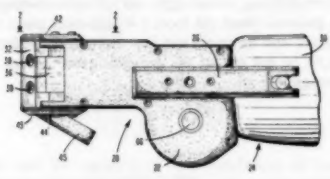
(b) the separation between corresponding points of said jaw sections increases as a function of the distance from said hinge when said legs are rotated together to a position in contact with each other.

4,425,708

RELAY CUTTING TOOL

Willard E. Rapp, Franklin Township, Somerset County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,580
Int. Cl.³ B23P *19/00*
U.S. Cl. 30—133 **11 Claims**



1. A tool for cutting and collecting an object comprising:

(a) a housing;

(b) a cutting means including a pair of jaws each having a cutting edge attached thereto, movable between a pre-engagement position and an engagement position, for cutting the object upon engagement therewith, said jaws are movably mounted so that each cutting edge faces the cutting edge of the associated jaw, so that when the jaws are moved into the engaged position the cutting edges of the jaws are caused to overlap;

(c) means, cooperating with the cutting means when said cutting means is engaged with the object, for forming an enclosed collection chamber for receiving and holding the cut object;

(d) the pair of jaws comprises a first jaw having a single arm and a second jaw having a pair of arms, each arm having a cam slot therein, the arm of the first jaw fitting between the arms of the second jaw;

(e) means for urging the first and second jaws into overlapping engagement so as to cut the object; and

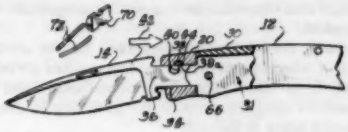
(f) means responsive to the urging means for returning the first and second jaws of the cutting means to the pre-engagement position.

4,425,709

POCKET TOOL

Phil Quenzi, Rte. 1 Box 56A, Atlantic Mine, Mich. 49905

Filed Dec. 21, 1981, Ser. No. 332,471
Int. Cl.³ B26B *5/00*
U.S. Cl. 30—151 **9 Claims**



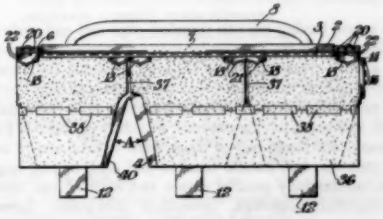
1. A tool accommodating removable and interchangeable tool blades comprising: a handle capable of simultaneously receiving one tool blade in a working position and at least one tool blade in a storage position, a first compartment defined in said handle for receiving said at least one tool blade in a storage position and including releasable locking means for removably and releasably locking said at least one tool blade in a storage position, a second compartment in said handle for receiving said one tool blade in a working position and including second releasable locking means for removably and releasably locking said tool blade in said working position, and at least one tool blade including cooperating locking means for removably and releasably locking with either of the first or second releasable locking means for releasably holding the tool blade removably assembled with the tool handle in either of the working position or storage position; wherein said second compartment comprises a slot; wherein said at least one tool blade comprises a working portion and a tang dimensioned to removably, slidably interfit with said slot; wherein said slot and said tang are substantially rectangular, and wherein said cooperating locking means comprises a notch formed in one side of said rectangular tang and said second releasable locking means comprises a rectractable stop member in one side of said slot for releasably locking with said notch when said tang is positioned so as to place said notch in registry with said retractable stop member; wherein said retractable stop member comprises an arcuate member and wherein said notch is arcuately shaped for receiving at least a portion of said arcuate retractable stop member.

4,425,710

ROOFING CAP CUTTER

Michael P. Mason, New Castle, and Robert R. Scaran, Newark, both of Del., assignors to Cap Cutters, Inc., Newark, Del.

Filed Jan. 7, 1982, Ser. No. 337,950
Int. Cl.³ B26B *13/04, 13/06*
U.S. Cl. 30—229 **6 Claims**



1. A device for cutting roofing caps comprising:

a supporting base large enough to hold thereon a standard, three-tab roofing shingle,

transverse hinge means extending along one edge of said supporting base and being affixed thereto,

a top plate for supporting cutting blades in a desired configuration, the top plate beng hinged to said supporting base by said hinge means along the one edge thereof, the top plate having handle means for raising the top plate in order to place a standard three-tab roofing shingle on said supporting base and for lowering the top plate to cut said roofing shingle as desired,

cutting blades supported in the desired configuration by said top plate,

there being cut-outs in said supporting base in the desired pattern whereby said blades and said cut-outs act cooperatively to cut said shingle in the pattern desired and permit unwanted shingle material to fall away and be discarded, said cut-outs being as follows:

(a) two interior wedge-shaped cut-outs having apexes substantially at the location of the interior ends of the two dividing slots in said standard roofing shingle when said shingle is placed upon said supporting base,

(b) two exterior beveled cut-outs each extending from one exterior end of said base at a point on a horizontal line extending through the apex of both interior wedge-shaped cut-outs inwardly parallel to one side of said wedge-shaped cut-outs,

the cutting blades in said top plate extending perpendicularly therefrom and being affixed so as to cooperate with said cut-outs to cut two interior wedges and two exterior bevels from said shingle, thereby producing three of said precision-cut roofing caps in one operation,

whereby precision-cut roofing caps are produced from each said shingle.

4,425,711

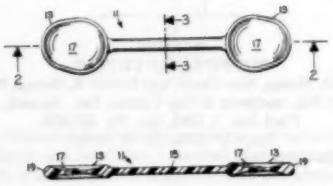
DOUBLE-ENDED DOUBLY-CONCAVED BABY SPOON

Geraldine E. Wood, 1220 Orchard, Springfield, Ill. 62702, and Ralph F. Staubly, 84 Danbury Dr., Springfield, Ill. 62704

Continuation-in-part of Ser. No. 53,190, Jun. 29, 1979, abandoned. This application Nov. 12, 1980, Ser. No. 208,232

Int. Cl.[3] **A47J** *43/28*

U.S. Cl. 30—324 **1 Claim**



1. A spoon having smooth rounded edge and end surfaces for facilitating self-feeding and for safely accelerating its learning by a baby, comprising: an elongated generally flat handle member including round smooth margins along its edges and a pair of generally flat heads integrally connected to said handle member, said heads having the same size and egg-shape in plan view, one head of said pair of heads fixed to each end of said handle member, said handle member and each of said heads lying in substantially parallel planes and each of said heads have oppositely disposed, same-sized concavities formed therein and equally spaced on each side of a plane through the handle with a smooth rounded rim formed around said oppositely disposed concavities and said handle, the thickness of each hand being equal and of slightly greater dimension than the thickness of the handle member, the length of the handle member being approximately twice the length of a head, and each of said four concavities being of the same size and shape.

4,425,712

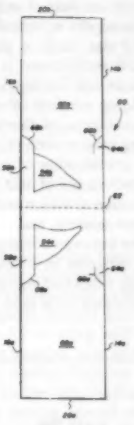
WOMAN'S OUTER GARMENT AND PATTERN THEREFOR

Willa D. L. Ratliff, 2838 Linhaven Dr., Mesquite, Tex. 75150

Division of Ser. No. 847,269, Oct. 31, 1977, abandoned. This application Nov. 14, 1979, Ser. No. 94,272

Int. Cl.[3] **A41H** *3/00*

U.S. Cl. 33—12 **12 Claims**



1. A pattern for a garment to be made from a single garment piece cut from a piece of folded-over fabric material, which comprises:

a single sheet of pattern material of a generally rectangular shape to be laid over a folded-over piece of fabric material,

said sheet defining joined right and left, mirror-image halves of a garment piece cut from a folded-over piece of fabric material, and having a cut line thereon for indicating an area to be cut out of the garment piece halves for arm openings.

4,425,713

POSTUREOMETER

Sam S. Roteila, 982 N. Brookside Dr., Lewiston, N.Y. 14092

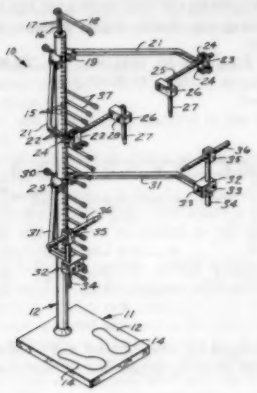
Filed Aug. 25, 1982, Ser. No. 411,590

Int. Cl.[3] **G01B** *5/20;* **A61B** *5/10*

U.S. Cl. 33—174 D **2 Claims**

1. A postureometer medical measuring instrument, comprising, in combination, a base member, an upright post mounted upon said base member, said post being cylindrical and hollow and additionally including a linear measurement along its length, an upper and a lower "C" yoke being each affixed by a set screw in selected locations along said calibrated post, a pair of angled arms affixed to each said yoke and extending horizontally therefrom, each said yoke being degree calibrated for rotational adjustment around said post, an outward end of each said arm being linearally calibrated and a first block being adjustably mounted along a length of said outward end of each said arm, a linearally calibrated first pin adjustably supported in said first block, a second block affixed on an end of said first pin and a linearally calibrated second pin adjustably supported

in said second block; said first pins of said upper yoke extending horizontally while said second pins thereof extend vertically, and said first pins of said lower yoke extend vertically and said second pins thereof extend horizontally.

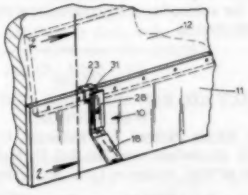


4,425,714

SIDING BOARD INSTALLATION TOOL

James B. Kelly, Jr., 1236 Edgmont, Des Moines, Iowa 50315

Filed Jun. 10, 1982, Ser. No. 387,240
Int. Cl.³ G01B 3/30
U.S. Cl. 33—187 **4 Claims**



1. A tool for assisting in the installation of horizontally overlapping siding boards on the exterior of a building, each board having an upper edge, a lower edge and an exposed exterior face, said tool comprising:

(a) An upstanding body member formed with a head portion at one end, a handle portion at an opposite end and a mid portion connecting between said head and handle portions and forming a transversely directed ledge therebetween; said head portion having a downwardly facing hook section for engaging the upper edge on one of said siding boards installed on said building whereby said tool depends from said upper edge;

(b) A gate member permanently attached to said mid portion of said body member and rotatably moveable in a plane generally parallel to the exposed exterior face of said one siding board between a siding engagement position and a non-engagement position; and

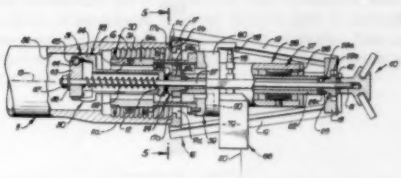
(c) Said head portion, mid portion and gate member coact together when said gate member is in the siding engagement position to form an upwardly facing channel section for receiving the lower edge of a second siding board to be installed on said building in overlapping relation to said first siding board whereby when said tool is in a depending relation to said first siding board, said lower edge of said second siding board is supported on the ledge formed by said mid-portion so that said tool serves as a cradle for assisting in holding said second siding board in a desired overlapping position with respect to said first siding board during installation of said second board on said building, and is thereafter removable from said depending relationship with said first siding board by rotation of said gate member to said non-engagement position.

4,425,715

THREAD GAGING APPARATUS AND METHOD

William Willis, South Pasadena, and Clyde C. Chivens, Laguna Beach, both of Calif., assignors to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 51,802, Jun. 25, 1979, abandoned. This application Mar. 16, 1981, Ser. No. 243,867
Int. Cl.³ G01B 5/16
U.S. Cl. 33—199 R **14 Claims**



1. In an instrument for gaging surfaces of a workpiece having a thread extending about an axis, the combination comprising

(a) a support including datum structure adapted to fit a workpiece shoulder which faces generally in the direction of said axis, the support also including a centrally and axially extending cylindrical guide member, a clamp engageable with a radially presented surface of said workpiece, and an axially extending actuator operatively connected with said clamp to cause the clamp to forcibly engage said workpiece surface,

(b) a carriage including a first section movable axially on said cylindrical member and a second section movable radially, one of said sections being carried by the other section, the one section being movable independently of said other section,

(c) a gaging part carried by said one section to be movable therewith both axially and radially to engage and gage different surfaces of said thread, and

(d) means operatively connected to said sections to produce outputs indicative of the extents of both axial and radial movements of the gaging part, said means including a first encoder operatively connected to the carriage first section to sense and encode axial movement thereof relative to the datum structure, and a second encoder operatively connected to the carriage second section to sense and encode radial movement thereof, each encoder including linearly relatively movable guide elements.

4,425,716

FLOATING NON-GIMBALLED COMPASS

John T. Fowler, Marblehead, Mass., assignor to The Laitram Corporation, New Orleans, La.

Filed Aug. 13, 1981, Ser. No. 292,351
Int. Cl.³ G01C 17/26
U.S. Cl. 33—355 R **19 Claims**

1. A remote-reading magnetic compass comprising:

a housing partially filled with a liquid;

a remote-reading compass assembly disposed within said housing and operative to provide electrical signals indicative of compass heading;

a float of a solid buoyant material surrounding said compass assembly for providing buoyancy to said compass assembly in said liquid and for biasing said compass assembly into a generally horizontal orientation, said float being

generally symmetrically disposed about said compass assembly along a first horizontal axis and along a second horizontal axis orthogonal to said first horizontal axis;

a pivot rod extending through said float along said first horizontal axis for permitting rotation of said compass assembly about said first horizontal axis, said pivot rod having a pair of ends extending from opposite sides of said float; and

a track circumferentially disposed about the interior of said

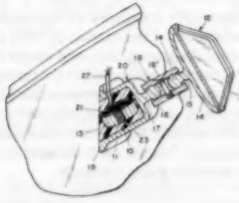
housing and having said pair of pivot rod ends riding therein in opposed, confronting sections of said track, said track permitting said compass assembly to rotate about said second horizontal axis over a predetermined arc and preventing rotation of said compass assembly about a vertical axis orthogonal to said first and said second horizontal axes, said track and said pivot rod together permitting said compass assembly to remain in a generally horizontal orientation under the buoyant influence of said float.

4,425,717

VEHICLE MAGNETIC SENSOR

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Jun. 24, 1982, Ser. No. 391,550
Int. Cl.³ G01C *17/28*
U.S. Cl. 33—361 **16 Claims**



6. An electrical compass system for a vehicle having a headliner and a rearview mirror mounted in the upper windshield area, said system comprising:

a rearview mirror assembly adapted to be mounted proximately to the windshield of a vehicle, said assembly including a flux-gate magnetic sensor and means for positioning said sensor in the windshield area near the headliner between the vehicle headliner and the rearview mirror;

means for supplying operating electrical current to said sensor and for receiving electrical signals therefrom;

circuit means coupled to said supplying means for processing signals from said sensor; and

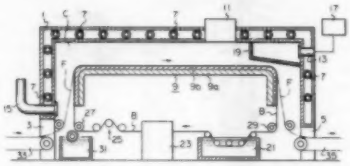
display means coupled to said circuit means for displaying the vehicle heading as sensed by said flux-gate sensor.

4,425,718

APPARATUS FOR DEVELOPMENT AND FIXATION OF DYES WITH A PRINTED TEXTILE SHEET BY APPLICATION OF MICROWAVE EMANATION

Bunshiro Kawaguchi, Kyoto, Japan, assignor to The Ichikin, Ltd., Japan

Filed Apr. 30, 1981, Ser. No. 258,889
Int. Cl.³ F26B *3/34*
U.S. Cl. 34—1 **13 Claims**



1. An apparatus for development and fixation of dyes on a printed textile sheet by application of microwave emanation comprising:

a housing forming therein a chamber which has an inlet and an outlet for said textile sheet;

an endless, flexible carrier belt arranged within said chamber and having a substantially horizontal section adapted for supporting said textile sheet in a flat, tensionless state;

means for driving said carrier belt to cause travel of said textile sheet supported thereby from said inlet to said outlet;

means for positively maintaining said carrier belt at selected temperature and moisture content;

means for applying microwave emanation to said textile sheet during said travel thereof; and

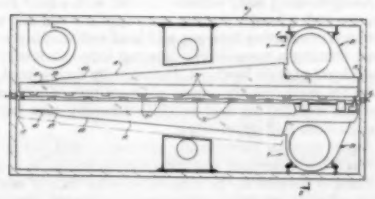
means for subjecting said textile sheet to steam during said travel thereof.

4,425,719

COMPACT AIR BAR ASSEMBLY FOR CONTACTLESS WEB SUPPORT

David M. Klein; Richard J. Wimberger, both of DePere; Michael O. Rocheleau, and Randall D. Helms, both of Green Bay, all of Wis., assignors to W. R. Grace & Co., New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 357,848
Int. Cl.³ F26B *13/20*
U.S. Cl. 34—156 **8 Claims**



1. An air bar assembly by which air is blown against one surface of a lengthwise moving web for contactless confinement of the web substantially to a horizontal plane, comprising a centrifugal blower having a substantially cylindrical rotor, and duct means for directing pressure air from said blower into the interior of each of a plurality of air bars that extend across the width of the web parallel to one another and to said plane and each of which has at least one air discharge outlet opening towards said plane, said air bar assembly being characterized by:

A. said duct means comprising an elongated ported wall that

is parallel to said plane and is at a side of each air bar remote from said plane, said ported wall having its length transverse to the air bars and having outlet ports therein at spaced intervals therealong, one for each air bar, each opening into its air bar intermediate the ends thereof;

B. said rotor

(1) being near a rear end of said ported wall,

(2) being spaced from the ported wall in a direction away from said plane, and

(3) having its axis substantially parallel to the lengths of the air bars;

C. an internal wall between the rotor and said ported wall and opposing the latter to cooperate therewith in defining an internal plenum chamber in the duct means from which certain of said outlet ports open, said internal wall

(1) extending along about one-third to one-half of the length of the ported wall and

(2) having a rear end portion which curves partway around the rotor in radially spaced relation thereto;

D. said duct means further comprising a flow controlling wall which has a rear end adjacent to the periphery of the rotor and which extends forwardly to a front end of the ported wall, said flow controlling wall being spaced in said direction from said internal wall and said ported wall and opposing them to cooperate with them in guiding air from the rotor to outlet ports in front of said internal wall; and

E. an enclosure for said rotor comprising a scroll wall that curves around the rotor at its side remote from the ported wall and extends from the rear end of said ported wall to a rear portion of said flow controlling wall, said scroll wall cooperating with said rear end portion of the internal wall to define an inlet to said plenum chamber for air expelled from the rotor.

4,425,720

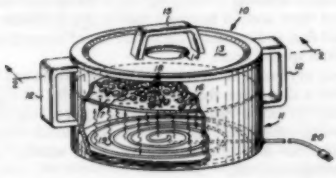
COFFEE ROASTER

Franklin R. Elevitch, 430 Nevada Ave., Palo Alto, Calif. 94301

Filed Mar. 5, 1981, Ser. No. 240,757

Int. Cl.³ F26B 9/00

U.S. Cl. 34—233 **7 Claims**



1. A roaster adapted to roast green coffee beans which comprises:

(a) a horizontal support formed with a multiplicity of openings which are small enough to retain a thin layer of coffee beans on the upper surface of the support, the number, pattern and area of the openings being such that radiant heat and hot air will pass freely through the support,

(b) a housing for the support which surrounds and confines the support and forms with the support an open upper compartment above the support and an open lower compartment below the support, the height of the upper compartment being substantially equal to or less than the depth of the lower compartment but sufficient to confine a thin layer of coffee beans during roasting,

(c) a reflector above the upper compartment capable of reflecting radiant heat back upon a layer of coffee beans on the support, such reflector being so designed and placed that it will not materially impede evacuation, by convection, of gases and smoke generated by the roasting process, and

(d) a source of radiant heat at the level of or beneath the horizontal support adapted to heat the horizontal support and a layer of coffee beans uniformly,

(e) the space between the horizontal support (a) and the source of radiant heat (d) being substantially unobstructed,

the design and configuration of the horizontal support, the housing and the reflector being such that during roasting of coffee beans on the horizontal support air heated by the source of radiant heat moves freely, uniformly and directly upwardly from the source of radiant heat through the lower compartment and through the horizontal support and the layer of coffee beans into the upper compartment and out of the roaster, such movement being induced substantially solely by such radiant heat whereby the green coffee beans are heated by the combination of radiation, conduction and convection to their isothermal point, moisture is evaporated from the beans at such isothermal point and the temperature of the dried beans then rises to effect roasting of the beans and development and retention of a desirable flavor.

4,425,721

WALKING SOLE

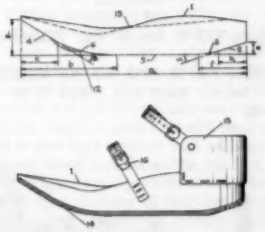
Eugene N. M. Spronken, Genk, Belgium, assignor to Spronken Orthopedie, Belgium

Filed Sep. 23, 1981, Ser. No. 304,922

Claims priority, application Belgium, Sep. 29, 1980, 885449

Int. Cl.³ A43B 3/12, 1/06

U.S. Cl. 36—11.5 **12 Claims**

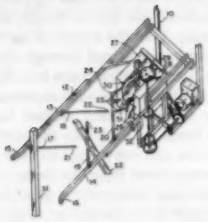


1. A walking sole adapted to be used under an immobilizing bandage on the lower leg for maintaining all foot joints in a rigid condition, said walking sole having a lower running surface coming into contact with the ground formed of three longitudinally spaced essentially flat parts, and said flat parts joining one another with rounded transitions, a forward one of said parts curved upwardly from a central part at an angle betwen 25° and 35° and a rear heel part sloping upwardly of said central part at an angle between 12° and 25°, sole dimensioned to provide a distance between a bottom plane of said central part to a highest point of said forward part of (11±1)% of a length factor and having a distance between said bottom plane of said central part and a highest point of said rear part of (3±1)% of said length factor, said length factor equal to 1.5 times the length of said sole in mm—15 mm, a rear end of said walking sole aligned approximately at a right angle to said central bottom plane, and an uppermost point of said rear end and an uppermost point on a front end of said sole aligned to lie in a plane approximately parallel to said bottom central plane.

4,425,722
APPARATUS FOR REMOVING STAKES FROM THE GROUND

Clarence G. Conover, 304 Wendi La., Ruskin, Fla. 33570

Filed Sep. 27, 1982, Ser. No. 424,246
Int. Cl.³ A01B 13/00; A01D 57/00
U.S. Cl. 37—2 P 21 Claims



1. An apparatus for removing stakes or the like from the ground and for collecting the same, comprising in combination:

a support framework;

a stake loosening means disposed on said support framework for loosening said stakes relative to the ground;

said stake loosening means including a plurality of stake loosening fingers;

a first pair of counterrotating rollers rotatably supported on said framework and disposed adjacent said stake loosening fingers for removing said loosened stakes from the ground;

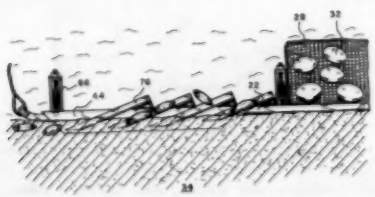
said counterrotating rollers defining therebetween a stake receiving passage; and

a stake guiding chute having an input end disposed adjacent said counterrotating rollers and an output end.

4,425,723
CLAM DREDGE

Peter Erlandsen, 122 E. Myrtle Rd., Wildwood Crest, N.J. 08260

Filed Jan. 28, 1983, Ser. No. 461,856
Int. Cl.³ E02F 5/00; A01K 75/00
U.S. Cl. 37—55 5 Claims



1. Apparatus for collecting shellfish and the like from the ocean floor comprising:

a pair of elongated longitudinally extending parallel spaced apart runners;

collection bag means mounted adjacent the rear of said runners for receiving and holding shellfish;

first and second parallel rows of tines carried by said runners, said rows extending between said runners and being substantially perpendicular thereto;

the tines in each row being substantially parallel to each other and extending downwardly and forwardly at an acute angle with respect to said runners;

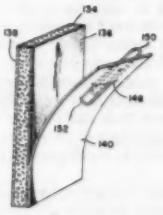
substantially rigid frame means supporting said rows of tines, said frame means comprising a pair of spaced apart longitudinally extending skid members and a plurality of crossbars extending between said skid members, said tines being secured to said crossbars;

each of said skid members including a horizontal portion adapted to rest on a different one of said runners and a vertical portion adapted to extend downwardly beneath the bottom surface of said runners, the lowermost portion of said skid members being at a lower level than the lowermost part of any of said tines.

4,425,724
PAPER HOLDING AND DISPLAYING DEVICE

Harvey Scott, P.O. Box 1623, Clemson, S.C. 29631

Filed Nov. 23, 1981, Ser. No. 323,905
Int. Cl.³ B09F 3/16
U.S. Cl. 40—11 A 7 Claims



1. In combination with a rigid, vertical surface, a paper holding and displaying device for attachment to said surface comprising:

a paper clip having first and second sections each comprising two legs connected together by a U-shaped loop, the legs and loop of each of the sections lying substantially in a common plane, and at least one leg of one of the first and second sections being connected to at least one leg of the other of said first and second sections at a location remote from both of said loops by a third section, one leg of the first section being located adjacent to one leg of the second section, and the other leg of the first section being located adjacent to the other leg of the second section, and said third section having a spring characteristic whereby said first and second sections are urged toward each other when spread apart;

a layer of flexible sheet material having a front and rear face, with a slit spaced from its edges, said clip having substantially its entire first section lying against said front face, having substantially its entire second section lying against said rear face and having its third section extending through said slit;

an additional flexible layer of material;

adhesive means securing one face of the additional flexible layer to the rear face of the layer of sheet material with the second section of the clip located between said layers; and

an adhesive coating on the opposite face of the additional flexible layer securing the device to said rigid, vertical surface.

4,425,725
COMBINATION SWITCH PLATE AND PHOTOGRAPH HOLDER

Matthew A. Moustakas, Warrington, and Edwin Olejkowski, Glenside, both of Pa., assignors to Freelance, Inc., Willow Grove, Pa.

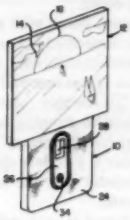
Filed May 21, 1982, Ser. No. 380,527
Int. Cl.³ A47G 1/06; H05K 5/03
U.S. Cl. 40—152 16 Claims

1. A combination switch plate and display holder for mounting over the toggel handle of a wall switch comprising,

a switch plate having a hole for receiving the toggle handle therethrough;

a photograph holder in overlying relation to the switch plate;

a clip means extending from the switch plate to secure the photograph holder to the switch plate; and



a mounting plate means carried by the photograph holder to engage the clip means;

whereby the photograph holder may be secured to the switch plate after the switch plate is mounted over the wall switch.

4,425,726

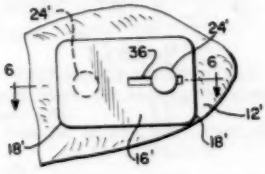
EAR TAG FOR ANIMALS

Edward E. Dvorak, P.O. Box 79, Manning, N. Dak. 58642

Filed Mar. 18, 1982, Ser. No. 359,232

Int. Cl.³ G09F *3/00*

U.S. Cl. 40—301 **11 Claims**



9. An animal ear tag including

(a) a body portion of generally rectangular shape adapted to be positioned wholly within the ear of the animal

(b) said body portion being made of a flexible molded plastic material characterized by being adapted to follow the contour of the ear and lying in flush engagement therewith

(c) said body portion being provided with an elongated slot disposed longitudinally of said rectangular body portion, and

(d) transversely spaced securing members extending through said body portion and ear for holding the tag in place

(e) each of said securing members including a shank having a head at one end, one of which shanks extends through the elongated slot of the body portion and is movable therein relative to said body portion as the animal ear grows

(f) the shank of the other of said securing members being molded in said body portion with the head thereof embedded therein and recessed from one face thereof, to prevent accidental displacement of said other securing member from said body portion and to provide a smooth uninterrupted surface on said face of the body portion for the application of indicia thereto.

4,425,727

INFORMATION BOARD

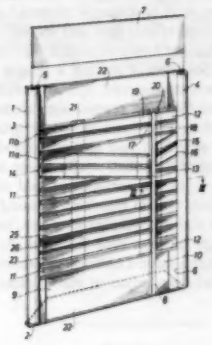
Bo Waldekrantz, S-150 55 Nykvarn, Sweden

Continuation of Ser. No. 108,513, Dec. 31, 1979, abandoned. This application Dec. 31, 1981, Ser. No. 336,049

Claims priority, application Sweden, Feb. 5, 1979, 7900977

Int. Cl.³ G09F *7/04*; B42F *17/08*

U.S. Cl. 40—600 **2 Claims**



1. An information board comprising a base member having an upper and lower end, first and second lateral support members including an extended portion spaced from and substantially parallel to said base member thereby providing first and second facing grooves defined by the spaces between said extended portions and said base member, partition means including first and second parallel spaced side edges arranged substantially parallel to said lateral support members and affixed to said base member so as to divide said base member into first and second panel portions, said first panel portion being defined by the area located between said first lateral support member and said first side edge of said partition means and said second panel portion being defined by the area between said second lateral support member and said second side edge of said partition means, said partition means including an upper end which is spaced from said upper end of said base member, a head sign element having first and second ends, said head sign element having a length substantially corresponding to the width of said base member such that said head sign element may be affixed to said base member with said first end of said head sign element being located within the first groove and said second end of said head sign element being located within said second groove, a plurality of first and second sign elements of relatively rigid construction releasably affixed respectively to said base member in said first and second panel portions, said first sign elements having a first predetermined length and first and second ends and said second sign elements having a second predetermined length and first and second ends, said first sign elements being longer than second sign elements, said sign elements adapted to be releasably affixed to said base member with said first ends of said first sign elements being located within said first groove, said second ends of said first sign elements being located substantially abutting said first side edge of said partition means, said first ends of said second sign elements being located in said second groove and said second ends of said second sign elements being located substantially abutting said second side edge of said partition means such that said sign elements may be removed from said base member substantially without bending by lifting said sign elements at said second ends in a direction substantially perpendicular to said base member without interference from said first and second edges of said partition means and adjacent sign elements while said first ends of said first and second sign elements are initially retained respectively within said first and second grooves, magnet means for releasably affixing said first

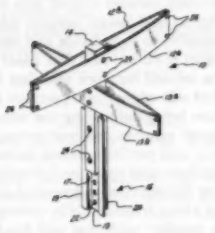
and second sign elements to said base member, said magnet means including magnetic material integral with said base member and at least one strip of magnetic material affixed to the surfaces of said first and second sign elements which are releasably affixed to said base member adjacent to said second ends of said first and second sign elements, said first sign elements including at least a second strip of magnetic material affixed to their surfaces releasably affixed to said base member, said at least one second strip of magnetic material being spaced from said at least one strip of magnetic material, and retaining means provided on each of said first and second sign elements for exchangeably retaining a pair of parallel information carrying strips on the faces thereof having a length substantially corresponding respectively to said first and second predetermined lengths of said first and second sign elements, said retaining means including two pairs of facing grooves formed along the length of said first and second sign elements, said pairs of grooves formed by substantially linear arm members extending obliquely from the surfaces of said sign elements, one of each of said pair of arm members forming said pairs of grooves on said first and second sign elements being disposed adjacent to each other thereon such that said plurality of first and second sign elements have a uniform appearance without a particular division between adjacent sign elements being noticeable thereon.

4,425,728

STREET SIGN ADAPTER UNIT AND STREET SIGN ASSEMBLY INCLUDING THE SAME

Paul G. Elliott, 117 Railroad Ave., Donaldsonville, La. 70346

Filed Dec. 15, 1981, Ser. No. 330,962
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—607 **5 Claims**



1. A street sign assembly comprising, in combination, a post having projecting, parallel coplanar side flanges between which there is provided a body of trapezoidal cross-section including side walls converging into a perforate rear wall, said rear wall being in parallel relation to said side flanges; an adaptor unit having a lower portion of a cross section designed for fitment between the converging side walls of said post and apertures in register with the perforations of said rear wall of said post and an upper portion of a length sufficient for attachment thereto of at least one sign panel; at least one sign panel; and means for securely fastening said adaptor unit and said at least one sign panel to said post.

4,425,729

FISHING ROD HOLDER FIXING MEANS

Toshiaki Miyamae, 36-8, Aramoto, Higashi-Osaka, Osaka-pref, Japan

Filed Aug. 20, 1981, Ser. No. 294,752
Int. Cl.³ A01K *97/10*
U.S. Cl. 43—21.2 **1 Claim**

1. A fishing rod holder fixing means, comprising a lengthy base having an axis and having a channel shaped cross section;

a rod holder means for detachably holding a grip portion of a fishing rod, provided at one end of the upper surface of said base;

a rod supporting means provided at the other end of said base;

a pair of plates mounted substantially intermediate of the bottom surface of said base and being selectively movable in relation to each other;

an angle adjusting means bored with a hole;

a cylindrical member supported between said pair of plates in pivotally movable relation with respect to a direction transvers to said axis of said base and supporting said angle adjusting means screwably contactable therewith, wherein said cylindrical member is positioned in a rod hole formed on a gunnel of a boat;

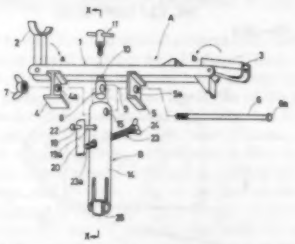
said cylindrical member is a hollow cylinder having at least a greater inner diameter than the outer diameter of said angle adjusting means;

a first pair of holes bored in said cylindrical member and adjacent to the upper part thereof and across the axis thereof, said first pair of holes being greater in inner diameter than the outer diameter of said first bolt means;

a second pair of holes bored in said cylindrical member, across the axis of said first pair of holes;

a first bolt means slidably inserted into said first pair of holes with an end thereof being in screwably adjustable relation by means of a suitable nut;

a third pair of holes bored in said cylindrical member in a position lower than said second pair of holes, and in axial alignment therewith;



a second bolt means slidably inserted into said third pair of holes and having one end thereof screwably tightened by means of a thumbscrew;

nut means supported within said cylindrical member in slidable relation with respect to said first bolt means;

a spacer means bored with a hole adjacent to the upper portion thereof and disposed outside of said cylindrical member;

a third bolt means inserted through said second pair of holes and said hole of said spacer means and having a foremost end thereof screwably connected with said nut means in screwably adjustable relation with respect to said spacer means and the outer circumferential surface of said cylindrical member, thereby to selectively adjust the space therebetween;

said spacer means having an inner surface area contactable with one end of said second bolt means inserted through said third pair of holes, in downwardly inclined relation with respect to the axis of said cylindrical member and adapted so that said inner surface area is adjustably pressed by means of a thumb nut integrally formed with the other end of said second bolt means;

adjustable rod support provided at the lower portion of said cylindrical member; and

said cylindrical member having a plurality of slits formed axially of the and in the lower portion thereof, so as to be slidably engaged with said adjustable rod support.

4,425,730

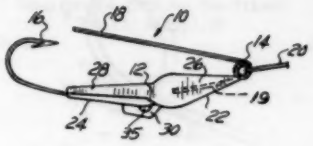
HYDRODYNAMIC FISHING LURE

Edward E. Goetz, Jr., 4611 Webberdale, Holly, Mich. 48442

Continuation-in-part of Ser. No. 36,576, May 7, 1979, abandoned. This application Aug. 10, 1981, Ser. No. 291,287

Int. Cl.³ A01K *85/00*

U.S. Cl. 43—42.11 **13 Claims**



1. A top water fishing lure comprising a lure body and an upper leg disposed above the lure body, said upper leg being formed integrally with a coil-shaped loop and a lower leg, said upper leg projecting rearwardly at an angle from the leading edge of the lure body, said lower leg being embedded within the lure body and said loop being disposed proximate the leading edge of the lure body for attaching a fishing lure, a hook affixed proximate the trailing edge of the lure body, said lure body further comprising a forward hull portion formed integrally with a rearward shank portion, at least one fin extending downwardly from the underside of said lure body at the trailing end of said hull portion and two outward bulges disposed on the underside of said lure body, wherein said lure body is configured to be relatively massive proximate the center thereof, said forward hull portion and rearward shank each have separate flat upper surfaces, said flat upper surfaces are joined at an angle of about 120° to 170°, and said bulges are located each on one side of said fin and beneath said angle joining said flat upper surfaces.

4,425,731

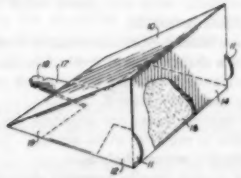
DISPOSABLE RODENT TRAP

Joseph Orlando, Mesa, Ariz., assignor to Farnam Companies, Inc., Phoenix, Ariz.

Filed Jul. 20, 1981, Ser. No. 285,148

Int. Cl.³ A01M *23/00*

U.S. Cl. 43—58 **11 Claims**



1. A trap for rodents comprising an enclosure including in combination:

a main base member;

first and second spaced-apart upstanding end walls attached to said base member;

a cover member attached to said first and second end walls and overlying said base member;

a side wall extending between said first and second end walls and said cover member and said base member with the upper edge thereof hingedly attached to said cover member, with an opening in said first end wall adjacent the junction of said side wall and said base member;

a moveable floor member overlying said base member in a first position adjacent the opening in said first end wall, the lower edge of said side wall being hingedly attached to said moveable floor member, wherein in the first position of said moveable floor member said side wall extends substantially vertically from the edge of said main base member to said cover member; and

means for moving said moveable floor member from said first position to a second position offset from the opening in said first end wall.

4,425,732

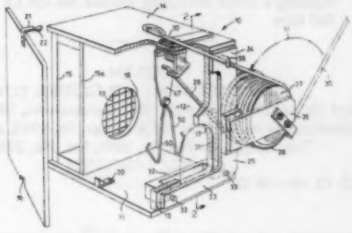
ANIMAL TRAP

Tadeusz E. Kania, R.R. #1, Winlaw, British Columbia, Canada

Filed Jun. 17, 1981, Ser. No. 274,489

Int. Cl.³ A01M *23/30*

U.S. Cl. 43—81 **10 Claims**



1. An animal trap comprising an enclosure and;

(a) an animal access opening in a front wall of the enclosure and a bait compartment adjacent a rear wall thereof;

(b) a coil spring carried by a bracket secured to the exterior of said front wall of the box and coiled about an axis normal to the front wall and having tengentially extending free end arms;

(c) a trigger and latch assembly within the enclosure;

(d) the first of said free end arms extending into the enclosure and adapted to be releasably engaged by the latch in a set position above the animal access opening;

(e) the second of said free end arms adapted to be moved from a relaxed position to a set position in which the coil spring is under maximum stress, and

(f) engagement means between the trigger and the latch which, upon movement of the trigger, releases the latch and allows the first of said free end arms to move across the animal access opening to impact on the floor of the enclosure adjacent the lower edge of the animal access opening.

4,425,733

FLY PAPER

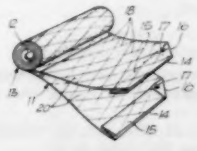
Helmut K. Ammon, and John G. Updike, both of Waiblingen, Fed. Rep. of Germany, assignors to FR. Kaiser GmbH, Waiblingen, Fed. Rep. of Germany

Filed Nov. 5, 1981, Ser. No. 318,455

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1981, 3127125

Int. Cl.³ A01M *1/14*

U.S. Cl. 43—115 **6 Claims**



1. An improved fly paper comprising a strip of material

having theron a sticky coating with two end portions being free of said coating, the strip being folded along a fold midway between said end portions with said end portions being adjacent each other and wrapped around said fold to form a roll, wherein:

(a) the strip is made up of a material which, for a given thickness has a higher tensile strength than paper;

(b) the end margin portions of said two end portions are reinforced by folding said end margin portions zig-zag, and one corner of each of said reinforced end margin portions being turned over and folded down and an eye placed therethrough for hanging said strip; and

(c) at least one of said coating free end portions of said strip forming the outermost turn of the strip on the roll, thereby forming a cover stretching around the roll for at least one full turn.

4,425,734

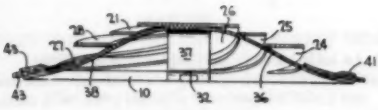
FLAT-PACKAGED AIR GLIDER TOY

Peter Bauer, 13921 Esworthy Rd., Germantown, Md. 20767

Continuation of Ser. No. 143,436, Apr. 24, 1980, abandoned. This application Jun. 19, 1981, Ser. No. 275,368

Int. Cl.³ A63H *33/18*

U.S. Cl. 46—74 D **8 Claims**



1. A flying saucer type toy comprising:

a flat disc member having a central region and a rim and plural through-cuts defined therethrough and extending in a generally spiral manner from said central region toward said rim to define blade portions between said through-cuts; and

means for securing said central portion out-of-plane with respect to said rim to create generally spiral-shaped spaces between said blade portions, said means for securing comprising a support member secured to diametrically-opposed locations of said rim;

whereby upon spinning said disc about an axis perpendicular to said central portion, air flows through said spiral-shaped spaces to impart a lift force to the disc related to the spin velocity;

said means including:

at least one strip member having a length at least equal to the distance between diametrically opposed locations on said rim;

support means for securing said strip proximate its mid-point to the central region of said disc such that any rotation of said strip relative to said rim produces similar rotation of said central region relative to said rim; and

engagement means for securing the ends of said strip to said diametrically opposed points on said rim which correspond to a position of said strip which is rotated relative to said rim sufficiently to force said central region out of the plane of said rim.

4,425,735

TOY VEHICLE DEVICE

Ralph J. Kulesza, Chicago, and Harry Disko, South Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jul. 21, 1982, Ser. No. 400,346

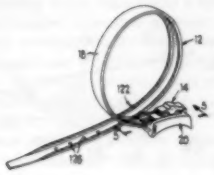
Int. Cl.³ A63H *11/10*

U.S. Cl. 46—202 **16 Claims**

1. A toy vehicle device wearable about a user's waist, said device comprising:

an elongate belt including a pair of end portions;

a buckle securable to one end portion of said belt and including means for releasably securing said buckle to the other end portion of said belt to secure said belt around the user's waist;



a toy wheeled vehicle sized for movement along the length of said belt; and

means on said buckle for releasably securing said vehicle to said buckle.

4,425,736

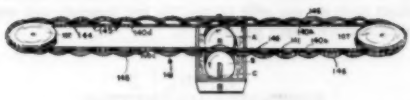
HERBICIDE APPLICATOR AND WELDED ENDLESS ROPE

Leon E. McClure, R.R. #2 Box 78, and Stanley R. McClure, Sr., R.R. #2 Box 161, both of Jamestown, Ky. 42629

Continuation-in-part of Ser. No. 177,166, Aug. 18, 1980, Pat. No. 4,320,595. This application Mar. 19, 1982, Ser. No. 359,867

Int. Cl.³ A01M *21/00*

U.S. Cl. 47—1.5 **15 Claims**



1. A liquid herbicide applicator for the selective application of herbicide to undesirable weeds, said applicator to be supported by a tractor, and which comprises in combination:

A. a centrally located supporting frame work attached to said tractor,

B. a tank associated with said frame work for holding a supply of liquid herbicide,

C. an immersion basin in operative relation with said tank for provision of a shallow liquid level of herbicide,

D. a boom supported by said frame work and extending laterally on each side thereof,

E. height adjustment means for adjusting the height of the boom relative to the crop to be treated,

F. a pair of distally mounted sheaves,

1. one each of said distally mounted sheaves being journalled at opposite ends of said boom,

G. a pair of medially mounted drums,

1. said pair of medially mounted drums being journalled directly over said immersion basin and extending down toward the bottom of said basin,

H. a first endless rope trained over each sheave of said pair of distally mounted sheaves and over and around each drum of said pair of medially mounted drums so that said rope is immersed in said liquid and wetted with herbicide upon every revolution of said medially mounted drums,

1. said endless rope, being fabricated of polymeric material and having been formed by application of heat to the free ends of the precursor of said endless rope, until the polymeric material of said free ends reaches fusion temperature and thereafter welding the melted material of said free ends together;

I. means for driving at least one of said drums, so as to drive

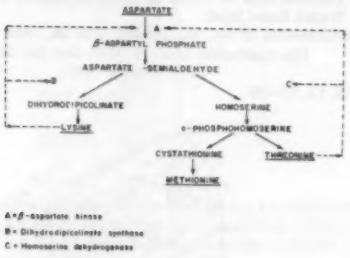
the wetted rope trained over said sheaves and in wiping engagement with the undesirable weeds.

4,425,737

METHODS FOR MUTANT SELECTION IN CEREAL CROPS

Randolph R. Henke, Knoxville, Tenn., assignor to Agrigenetics Research Associates Limited, Boulder, Colo.

Filed Oct. 14, 1981, Ser. No. 311,405
Int. Cl.³ A01G 1/00
U.S. Cl. 47—58 **25 Claims**



1. A method for isolating mutant plants of a cereal crop, comprising:

(a) mutagenizing a population of cereal seeds to form a mutagenized population comprising mutant seeds and non-mutant seeds;

(b) growing the mutagenized population to mature plants and allowing each mature plant to self-pollinate;

(c) havesting the progeny seeds of the mature plants;

(d) dissecting each harvested seed to form an embryo-less half-seed and a corresponding embryo-containing portion;

(e) incubating each embryo-less half-seed individually in medium containing gibberellic acid and under at least one non-hormonal selection pressure which prevents embryo-less half-seeds of non-mutant seeds from producing alpha-amylase;

(f) identifying the embryo-containing portions of mutant seeds by observing the ability of corresponding embryo-less half-seeds to produce alpha-amylase under said selection pressure; and

(g) growing the identified embryo-containing portions of mutant seeds to product mutant plants.

4,425,738

AUTOMATIC THRESHOLD SEAL FOR A DOOR

Curtis M. Christensen, R.R. 2, Box 71, Slayton, Murray County, Minn. 56172

Filed Nov. 24, 1982, Ser. No. 444,282
Int. Cl.³ E06B 7/20
U.S. Cl. 49—310 **5 Claims**

1. An automatic threshold seal for a door, comprising:

a door foreshortened at its bottom;

an elongated housing having an open bottom affixed to the bottom of said door, said housing of a vertical depth such that when affixed its bottom will be above the threshold a sufficient distance to allow clearance above anticipated obstructions within its swing path, said housing including:

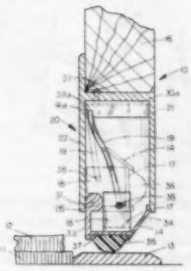
a rectangular vertical weather wall extending the width of said door;

a first endwall adjacent to the hinged edge of said door and having an aperture therethrough; and

a second endwall adjacent to the unhinged edge of said door;

means pivotally mounted at a lower level than the aperture through the first endwall, to each of the lower portions of and intermediate the first and second endwalls of said housing for engaging the threshold area between the jambs of said door;

a apertured member affixed to said threshold-engaging means intermediate the ends thereof and oriented towards the open bottom of said housing said aperture therethrough axially parallel with the pivotal axis of said threshold-engaging means and offset horizontally in the same direction from both the pivotal axis of said threshold-engaging means and the hole through the first endwall;



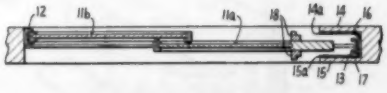
a spring rod, spring loaded within said housing through the aperture through the first endwall thereof, then through said apertured member, and then to a means for stopping its further travel, the length of said rod being such that when it is loaded and said door is somewhat open, a portion thereof will extend past the first endwall of said housing.

4,425,739

SLIDING PANEL WITH SOUND-TRAP FRAMING

Maurice A. Garbell, P.O. Box 948, San Francisco, Calif. 94104

Continuation of Ser. No. 104,414, Dec. 17, 1979, abandoned.
This application Sep. 15, 1981, Ser. No. 302,697
Int. Cl.³ E05B 7/16
U.S. Cl. 49—424 **2 Claims**



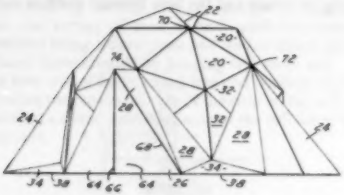
1. In combination with a vertical, horizontally slidable panel that is reciprocally movable and engageable with a vertical bar stop or jamb at a position of closure, a sound guard comprised of a pair of parallel and transversely spaced-apart sound-inhibiting wall members, said wall members extending horizontally from said vertical bar stop parallel to said sliding panel for receiving said panel therebetween, the space between wall members providing a transverse gap spacing between said panel and each wall member, the horizontal extension of each wall member from said bar stop being at least two and one-half times the transverse gap spacing between said panel and wall members; and a pair of sealing-strip means mounted on opposite sides of said panel and engageable with the ends of said wall members, respectively, when said panel is slidably positioned into engagement with said bar stop, whereby said panel may be moved horizontally into a position to provide a substantial opening around the end of said panel and between said panel and said bar stop while positioned between said wall members.

4,425,740

EDGE CONNECTED THREE DIMENSIONAL STRUCTURES

Frederick L. Golden, 1415 Beechwood, Ann Arbor, Mich. 48103

Filed Dec. 2, 1980, Ser. No. 212,121
Int. Cl.³ E04B *1/32*
U.S. Cl. 52—81 **17 Claims**



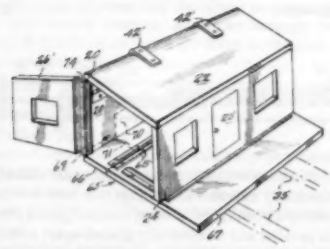
1. A panel connector for multipanel structural shapes comprising a pair of parallel channels, central hinge means joining the parallel channels together lengthwise of the channels, separate lateral hinge means joining at least one relatively rigid channel side to a corresponding relatively rigid channel bottom lengthwise of the channel and one side of at least one channel being non-hinged to the channel bottom, said central integral hinge joining the channels together adjacent the juncture of the non-hinged channel side and the corresponding channel bottom of the one channel.

4,425,741

COLLAPSIBLE STRUCTURE

Anne A. Ronai, Apartado: 68439, Caracas 106, Venezuela

Continuation of Ser. No. 969,414, Dec. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 810,567, Jun. 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 727,553, Sep. 28, 1976, Pat. No. 4,037,965, which is a continuation of Ser. No. 539,763, Jan. 9, 1975, abandoned. This application Dec. 5, 1980, Ser. No. 213,487
Int. Cl.³ E04B *1/346*
U.S. Cl. 52—70 **13 Claims**



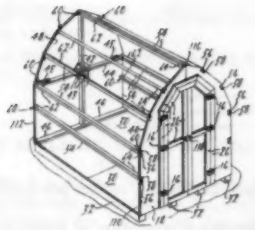
1. A convertible structure comprising:
- a free-standing rear wall having top and bottom edges extending generally linearly and defining a generally vertical plane;
- means operatively connecting said free-standing rear wall to the ground for supporting the rear wall in free-standing position;
- a roof having opposed front and rear edges extending generally parallel to said rear wall top and bottom edges, said roof being pivotally connected at its rear edge to an upper portion of said rear wall;
- a front wall pivotally connected to said roof generally along the front edge of said roof; and
- side walls pivotally mounted to said rear wall, so that said side walls, front wall and roof can be pivoted and folded together into a vertically extending stack so that all of said side walls, front wall, and roof extend generally parallel to said rear wall, and so that said rear wall is disposed between said side walls and said roof when said vertical stack is formed.

4,425,742

BUILDING CONSTRUCTION AND PURLIN HANGER THEREFOR WITH METHOD OF CONSTRUCTION

Dennis P. Markey, West Bloomfield, and George J. Rosen, Franklin, both of Mich., assignors to Markey Brothers Co., Walled Lake, Mich.

Continuation of Ser. No. 155,381, May 30, 1980, abandoned. This application Mar. 19, 1982, Ser. No. 360,078
Int. Cl.³ E04B *7/02*
U.S. Cl. 52—90 **7 Claims**



1. A building construction for a storage hut comprising:
- two planar supports, each having an interior surface facing the other support, an exterior surface facing away from the other support, and a periphery extending along the top and two sides thereof;
- purlins extending between said planar supports at selected locations;
- hanger means for spanning said purlins between said supports comprising
  - seat means for supporting said purlins having means to attach said purlins to said hanger,
  - integral nail means for attaching said hanger to the exterior surfaces of said planar supports, and
  - arm means for connecting said seat means and said attachment means,
  - wherein said purlin is secured to each said planar support by hanging said hanger means over the edge of said planar support and attaching said nail means through the exterior surface of said planar support into said planar support; and
- means for locating and holding said hanger means in a proper position along the periphery of said planar support for accurate disposition of said purlins prior to attaching said hanger means to said exterior surface of said support by said integral nail attaching means.

4,425,743

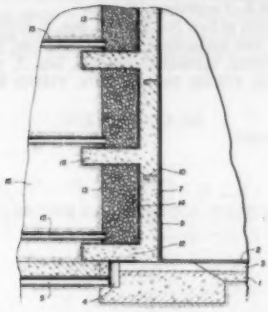
INGROUND FLUID STORAGE TANK AND METHOD OF ERECTION THEREOF

Joseph Bartur, 18 Daphna St., Tel-Aviv, Israel

Filed Nov. 17, 1980, Ser. No. 207,745
Int. Cl.³ B65D *88/76*
U.S. Cl. 52—169.5 **13 Claims**

1. An inground tank comprising a drainage shaft, a foundation having radial and peripheral trenches connected to said drainage shaft, an inner steel shell, an outer mantle of gabions and a concrete wall having horizontal rims cast between the steel shell and the gabions, each ring of gabions being connected separately to the drainage shaft, a polyethylene sheet,

said gabions having an inner surface covered before casting the concrete by said polyethylene sheet, a plurality of sloped beams, a conical steel shell constructed on said sloped beams



and welded to said steel shell, a roof having a central portion, central columns supporting said central portion which comprises prefabricated concrete segments, the complete tank being covered by a layer of earth.

4,425,744

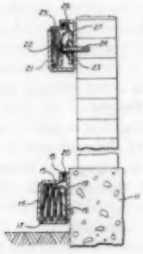
SYSTEM OF FLOOD PROTECTION FOR BUILDINGS

Carlos Villareal, 813 Bledsoe #12, Lufkin, Tex. 75901

Filed Aug. 5, 1981, Ser. No. 290,398

Int. Cl.³ E04H *9/14*

U.S. Cl. 52—169.14 **11 Claims**



1. A system of flood protection for a building having a foundation which is not permeable to water comprising the combination with said building of

a lower continuous skirt of plastic film secured to said building foundation by a waterproof seal,

means secured to said building in a fixed position enclosing and supporting said lower plastic film skirt in a rolled or folded condition adjacent to said foundation,

an upper continuous skirt of plastic film secured to an upper level of said building above the maximum projected rise of flood waters,

means secured to said building in a fixed position enclosing and supporting said upper plastic film skirt on said building in a rolled or folded condition at said upper level,

said upper and said lower plastic film supporting means each being easily opened to permit said upper and said lower plastic film to be unrolled or unfolded toward each other, and

said lower and said upper plastic film skirts each extending around said building and each having edge portions providing a waterproof seal with the other and being of a size and shape permitting said edges to be quickly joined in a water tight seal to prevent flood waters from entering said building.

4,425,745

OUTER WALL SUSPENDED IN FRONT OF A METAL STRUCTURE

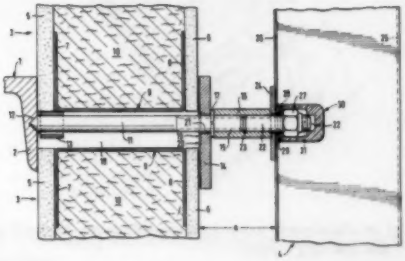
Johannes Grätz, Düsseldorf, and Ferdinand Kerstges, Essen, both of Fed. Rep. of Germany, assignors to Steag Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,824

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021198

Int. Cl.³ E04H *1/00*

U.S. Cl. 52—235 **18 Claims**



1. An outer wall, comprising plate-like sound damping elements with a rear vented facade liner as a weather protection; and means for suspending said sound damping elements with said rear vented facade liner, said suspending means including a plurality of cross bars, a plurality of thread bolts connected with said cross bars and extending through said sound damping elements so that a portion of each of said thread bolts extends in a gap between said sound damping elements and said rear vented facade liner, a plurality of further thread bolts arranged into said rear vented facade liner and also having a portion extending in the gap between said sound damping elements and said rear vented facade liner, a thread bushing composed of corrosion resistant material and screwed at least over said portion of each of said first mentioned thread bolts and over said portion of each of said further thread bolts to cover the same, and a nut screwed at an outer side of said rear vented facade liner on an end portion of each of said further thread bolts.

4,425,746

INVERTED ROOF SYSTEM

Orland H. Bonaguidi, 1363 Cottontail La., La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 332, Jan. 2, 1979, Pat. No. 4,272,936. This application Jun. 15, 1981, Ser. No. 273,864

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ E04B *5/00*

U.S. Cl. 52—309.12 **11 Claims**

1. An inverted roof structure, comprising:

(a) roof support means;

(b) a roof deck secured to said support means;

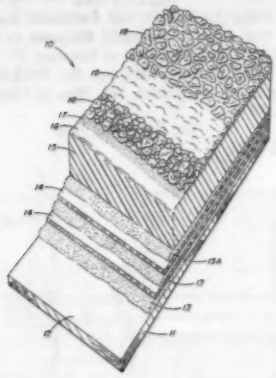
(c) a water impermeable membrane affixed to the exposed surface portion of said deck;

(d) a sealant-adhesive coat disposed on said membrane;

(e) a thermal-insulation layer comprised of closed-cell plastic foam disposed upon said sealant-adhesive coat;

(f) a toothing surface secured upon said thermal-insulation layer, said toothing surface comprising a layer of adhesive disposed upon said thermal-insulation layer and a plurality of particles of inorganic material partially embedded in said adhesive, said particles being in a quantity sufficient to provide substantially continuous and contiguous parti-

cle contact over substantially the entire surface of said adhesive; and



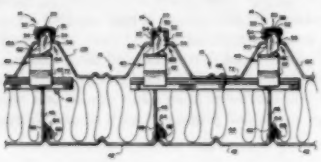
(g) an elastomeric water impermeable layer disposed over said toothing surface.

4,425,747

TWIN-VEE CEILING HANGER CLIP

Wayne H. Player, Mesquite, Tex., assignor to Howmet Aluminum Corp., N.Y.

Filed Jun. 22, 1981, Ser. No. 275,605
Int. Cl.³ E04B 1/74
U.S. Cl. 52—404 7 Claims



1. An insulation system for use with a twin-vee patio type roof having longitudinal panels with alternating longitudinal ribs and troughs, said ribs rising to apices having downwardly open longitudinal slots with substantially vertical walls, said insulation system comprising:

ceiling panels;

at least one clamp having a main body and a roof engaging end;

said roof engaging end of said clamp comprising:

a diagonal plate;

an extended engaging edge on said diagonal plate;

and a set screw threadingly engaged through said diagonal plate;

said extending engaging edge and said set screw engage opposite walls of said slot at an apex of said twin-vee roof, thereby securely lodging said clamp to the underside of said roof;

means for connecting said main body of said clamp to said ceiling panels said ceiling panels being suspended from said roof through said clamps, thereby creating a cavity between said roof and said ceiling panels;

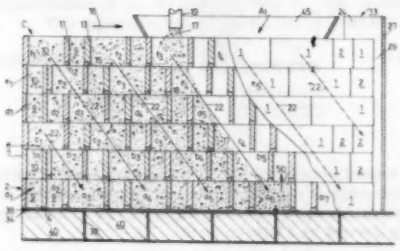
insulation placed within said cavity between said roof and said ceiling panels

4,425,748

BUILDING BLOCK SET AND METHOD FOR BUILDING WITH SUCH A BLOCK SET

Gerard De Waele, Heldergem, Belgium, assignor to Hanota Holdings S.A., Luxemburg, Belgium

Continuation of Ser. No. 830,095, Sep. 2, 1977, Pat. No. 4,237,670. This application Sep. 23, 1980, Ser. No. 189,830
Claims priority, application Belgium, Sep. 2, 1976, 170293; Nov. 16, 1976, 172389; Dec. 13, 1976, 173192; Mar. 1, 1977, 175359
Int. Cl.³ E04B 2/54
U.S. Cl. 52—436 23 Claims



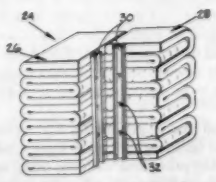
1. A wall construction comprising superimposed rows of hollow blocks into which binder, for example concrete, has been poured, said construction including two forms of block, a first form of block having cross walls and side walls which define a straight, rectangular parallelipiped which has a hollow volume extending through the whole height of the block, the side walls being extended at least at one end by two flanges whose length is a fraction of the length of the parallelipiped thereby defining a hollow volume which is short relative to the long hollow volume of said parallelipiped, and a second form of block of U-shaped horizontal cross-section having a cross wall and flanges whose outer surfaces are co-planar with the outer surface of the flanges of the first form of block, the blocks being positioned so that in each row long and short ones of said hollow volumes alternate and in successive rows the cross walls of each row, except the lowermost, are displaced horizontally relative to the cross walls of the next lower row by a distance of the order of the length of one of said short hollow volumes, said displacements in the consecutive rows being in the same direction towards one end of the wall construction, whereby both vertical shafts and slanting channels exist between said hollow volumes which facilitate the flow of said binder through said hollow volumes during said pouring.

4,425,749

FURNACE LINING MODULE

William H. Parker, Mt. Lebanon, Pa., assignor to Manville Service Corporation, Denver, Colo.

Filed Dec. 14, 1981, Ser. No. 330,285
Int. Cl.³ E04B 1/80
U.S. Cl. 52—509 10 Claims



1. An article for insulating portions of two walls in the

region of a corner or similar discontinuity in a furnace, said article comprising an L-shaped module with first and second multi-layered arm portions including a first generally L-shaped member with first and second multi-layered leg portions, said first leg portion corresponding generally to said first arm portion, a second member interleaved in serpentine fashion with said second leg portion to form said second arm portion, means to attach said first and second arm portions to their respective furnace walls.

Patent Not Issued For This Number

4,425,751

AUTOMATIC ASPARAGUS PICKING MACHINE

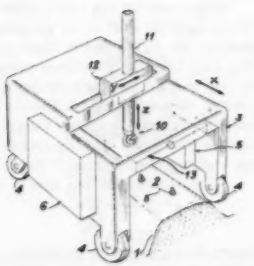
Gerard Bousseau, Talence; Pierre Baylou, Bordeaux; André Mora, Gradignan; Michel Monsion, Carignan-Latresne, and Christian Bouvet, Canejan, all of France, assignors to Ecole Nationale Superieure d'Electricite et de Radioelectricite de Bordeaux (E.N.S.E.R.B.) U.E.R. Dérogatoire de l'Université de Bordeaux, Talence, France

Filed Dec. 8, 1981, Ser. No. 328,530

Claims priority, application France, Sep. 12, 1981, 80 26502

Int. Cl.³ A01D *45/00, 69/00*

U.S. Cl. 56—327 A **13 Claims**



1. An automatic asparagus picking machine comprising a movable chassis, means for displacing and controlling the direction of displacement of said chassis parallel to a mound of soil in which asparagus to be picked are grown, an asparagus picking tool, means mounting said asparagus picking tool for horizontal and vertical translation at right angles to the direction of displacement of said chassis, detection and control means for detecting asparagus to be picked and controlling the position of said picking tool, the improvement wherein said detection and control means comprises a camera system and a lighting system for back lighting the mound of soil, said camera and lighting systems being mounted on said chassis so as to be on opposite sides of the mound and arranged substantially in a horizontal plane adapted to coincide with the top of the mound, said means for displacing and controlling the displacement of said chassis including microprocessor means for controlling the direction of displacement of said chassis parallel to the mound, motor means for horizontal and vertical translation of said picking tool, said microprocessor means also controlling the horizontal and vertical translation of said picking tool for extracting a detected asparagus from the mound and transferring it to a receptacle.

4,425,752

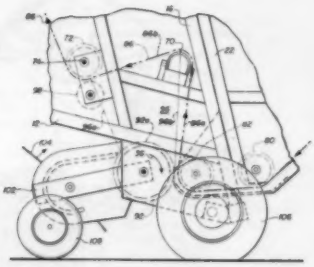
BALING MACHINE WITH ROLLER-TYPE FLOOR

Donald L. Sheesley, New Holland, and Willis R. Campbell, Ephrata, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Sep. 16, 1981, Ser. No. 302,929

Int. Cl.³ A01D *39/00*

U.S. Cl. 56—341 **7 Claims**



1. A roll baling machine having forward and rearward ends, comprising:

(a) a base frame;

(b) a floor roller mounted on said base frame for supporting crop material;

(c) apron means supported on said base frame cooperating with said floor roller for forming a roll bale of crop material;

(d) the upper surface of said floor roller cooperating with said apron means to define a bale forming chamber of generally wedge shape in side elevation having a forward end which is narrower than the rearward end thereof;

(e) said apron means having a first course extending upwardly and rearwardly from a first location adjacent said floor roller to a second location above said floor roller and a second course extending downwardly and forwardly from said second location to a third location above said floor roller when the machine is empty; and

(f) said bale forming chamber having a bottom wall defined by said floor roller upper surface, a rear wall defined by said apron means first course, and a top wall defined by said apron means second course.

4,425,753

CLUTCH MECHANISM FOR BALING MACHINE

John H. Freimuth, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Sep. 16, 1981, Ser. No. 302,930

Int. Cl.³ A01D *39/00*

U.S. Cl. 56—341 **6 Claims**

1. A roll baling machine, comprising:

(a) a base frame;

(b) a rear frame pivotally connected to said base frame for movement between a lower position and an upper position;

(c) a floor roller movably mounted on said base frame for supporting crop material;

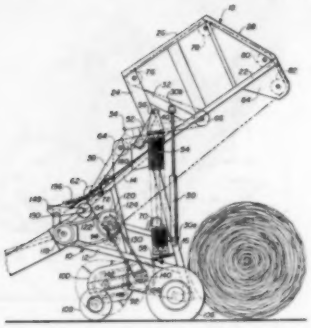
(d) bale forming means movably supported on said base frame cooperating with said floor roller for forming a roll bale of crop material;

(e) first drive means on said base frame adapted for receiving power from a tractor;

(f) second drive means on said base frame adapted for receiving power from said first drive means, said second drive means connected to said floor roller and said bale forming means for imparting movement to said floor roller and

said bale forming means in a first direction during formation of a roll bale;

(g) clutch means drivingly connecting said first and second drive means when said rear frame is in its lower position so that said second drive means imparts movement to said floor roller and said bale forming means in said first direction; and



(h) said clutch means drivingly disconnecting said first and second drive means when said rear frame is moved to its upper position so that said second drive means is precluded from imparting movement to said floor roller and said bale forming means in said first direction.

4,425,754

SPINNING MACHINE INFORMATION GATHERING APPARATUS AND METHOD

John E. Lane, Littleton, Mass., assignor to Parks-Cramer Company, Fitchburg, Mass.

Filed Sep. 24, 1979, Ser. No. 77,930
Int. Cl.³ D01H 13/32
U.S. Cl. 57—265 **12 Claims**

1. In apparatus for gathering information regarding the operating conditions of a group of ring spinning machines in a textile mill wherein at least one traveling unit is supported for travel along a predetermined path for traversing one or more of the machines with detectors mounted on the traveling unit for monitoring ends of strand material normally being formed by a traversed machine, and further wherein the apparatus has a data system responsive to the detectors on the traveling unit for determining the conditions of each machine of the traversed group of machines, an improvement in the data system which facilitates correlation of information gathered with a traversed machine, the improvement comprising:

identification detector means mounted on the traveling unit for movement therewith and for originating and transmitting to the data system machine identification signals, and

identification encoding means mounted in predetermined relation to a corresponding traversed machine for scanning traversal of said encoding means by said detector means,

said identification detector means and encoding means cooperating upon scanning traversal of said encoding means by said detector means for generating an identification signal uniquely correlated to a specific individual machine.

7. In a method of gathering information regarding the operating conditions of a group of ring spinning machines in a textile mill wherein one or more machines are traversed by at least one traveling unit supported for travel along a predetermined path while ends of strand material normally being formed by a traversed machine are monitored by detectors mounted on the traveling unit, and further wherein the condition of each machine is determined by a data system responsive to the detectors, an improvement which facilitates correlation of information gathered with a traversed machine, the improvement comprising:

scanning with an identification detector mounted on the traveling unit an identification encoder mounted in predetermined relation to a corresponding traversed machine, and

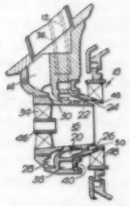
generating in response to said scanning an identification signal uniquely correlated to a specific individual machine.

4,425,755

GAS TURBINE DUAL FUEL BURNERS

Eric Hughes, Nuneaton, England, assignor to Rolls-Royce Limited, London, England

Filed Sep. 10, 1981, Ser. No. 300,747
Claims priority, application United Kingdom, Sep. 16, 1980, 8029928
Int. Cl.³ F02C 7/00
U.S. Cl. 60—39.55 **3 Claims**

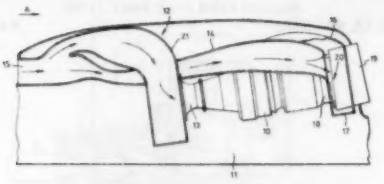


1. A gas turbine engine dual fuel burner comprising liquid fuel ducting, gaseous fuel ducting, a central air passage, an annular air passage, and water ducting, said liquid fuel ducting including an annular liquid fuel passage opening into said central air passage and formed between said central air passage and an outer sleeve which terminates downstream of the end of said central air passage, said annular liquid fuel passage containing angled apertures through which liquid fuel is constrained to flow and which impart a swirling motion to the liquid fuel, said central air passage being axial and open at both ends to receive a flow of compressed air at its upstream end for flow in a direction parallel to the longitudinal axis of said central air passage and to discharge a flow of compressed air and fuel from its downstream end, said central air passage having axial air swirling means adjacent its upstream end and upstream of injection of fuel into the same, said gaseous fuel ducting having angled outlets opening into said central air passage immediately downstream of said air swirling means and arranged to impart a swirling motion to the gaseous fuel, said annular air passage containing an axial air swirling means and being located adjacent the downstream end of said outer sleeve, said water ducting including a manifold having outlets to inject water into air flowing into said annular air passage.

4,425,756
GAS TURBINE ENGINE AND ITS ASSOCIATED AIR INTAKE SYSTEM

John R. Ballard, Chesham; George H. Bennett, Hendon, and Leslie A. Lee, Whitton, all of England, assignors to Rolls-Royce Limited, London, England

Filed Feb. 9, 1982, Ser. No. 347,332
Claims priority, application United Kingdom, Mar. 20, 1981, 8108769
Int. Cl.³ F02C 7/052
U.S. Cl. 60—39.092 4 Claims



1. A gas turbine engine and its associated air intake system comprising:

a gas turbine engine having an air inlet at one end thereof and an exhaust nozzle at the other end thereof with a tail pipe extending downstream therefrom, said gas turbine engine being mounted on a generally horizontal axis;

a first generally horizontally extending duct having an air intake at one end and an outlet at the other end and arranged for the passage of air therethrough, said first generally horizontally extending duct having a major portion thereof positioned juxtaposed to and vertically above a major portion of said gas turbine engine;

means for inducing an air flow through said first duct;

and a second duct connected at its upstream end to the vertical upper portion of said first duct and extending to and connected with said air inlet of said gas turbine engine, said second duct receiving air derived only from a vertically upper region of said first duct and passing the same therethrough into the intake of said gas turbine engine without drawing a hot boundary layer of air into the intake of said gas turbine engine.

4,425,757
INSTALLATION FOR RECOVERING ENERGY FROM SOLID FOSSIL FUELS, MORE PARTICULARLY BITUMINOUS COAL HIGH IN INERTS

Klaus Heyn, and Hans J. Pogrzeba, both of Essen, Fed. Rep. of Germany, assignors to Steag Aktiengesellschaft, Essen, Fed. Rep. of Germany

Division of Ser. No. 925,708, Jul. 18, 1978, Pat. No. 4,255,926. This application Dec. 29, 1980, Ser. No. 220,738
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2733029
Int. Cl.³ F02C 6/18
U.S. Cl. 60—39.182 4 Claims

1. An installation for recovering energy from solid fossil fuels, more particularly, fuels high in inerts, and particularly bituminous coal, said installation comprising;

at least one steam generating, wet bottom boiler pressure fired with ground fuel for converting the solid fuel to flue gas;

gas turbine means operable by the flue gas for driving electrical generations means;

steam turbine means operable by the steam from said boiler for driving electrical generation means;

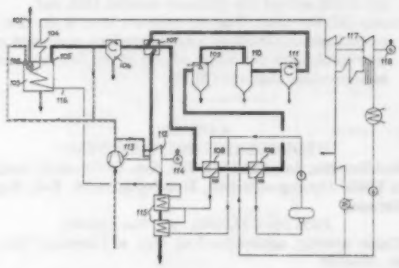
desulfurizing means interposed between said boiler and said gas turbine;

gas-gas heat exchanger means interposed between said wet bottom boiler and gas turbine in which pressurized flue gases emerging from said wet-bottom boiler are cooled by subsequently treated flue gases;

dust removing means interposed between said boiler and said gas turbine;

first gas-liquid heat exchanger means interposed in the outlet of said gas turbine means, in which the flue gases emerging from said turbine heat feed water for said boiler;

second gas-liquid heat exchanger means interposed between



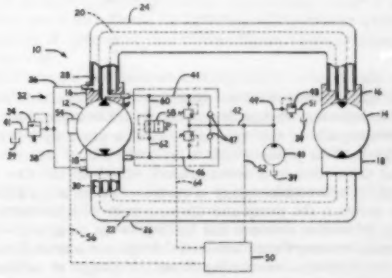
said gas-gas heat exchanger and said desulfurizing means, in which flue gases emerging from said gas-gas heat exchanger means preheat feed water for said wet-bottom boiler; and

a washing unit interposed downstream of said second gas-gas heat exchanger for removing dust, SO_2, chlorine, fluorine and NO_x from the flue gases, said cleaned flue gases being reheated in said gas-gas heat exchanger to drive said gas turbine.

4,425,758
MAINTAINING HYDROSTATIC SYSTEM CONTROL PRESSURE

Lawrence F. Schexnayder, Joliet, and Jerome A. Thies, Geneseo, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 24, 1982, Ser. No. 361,306
Int. Cl.³ F16D 39/00
U.S. Cl. 60—403 6 Claims



1. In a hydrostatic transmission (10) including a variable displacement pump (12) having a pump control mechanism (54), a fluid motor (14), first and second high pressure conduits (20,22) operatively connecting the pump (12) and motor (14) in a continuous circuit, a system control (50) for controlling the operation of the hydrostatic transmission (10), a source of fluid pressure (40) receiving fluid from a tank (39) and in selective fluid communication with the first and second high pressure conduits (20,22) and the system control (50) for providing make-up fluid to the first and second high pressure conduits (20,22) and for supplying fluid to said system control (50) at a predetermined pressure level, and a system control relief valve

(48) for maintaining the predetermined pressure level of the fluid from the fluid source (40), the improvement comprising:

first and second low pressure conduits (24,26) respectively disposed about said first and second high pressure conduits (20,22), a first space (28) defined between an outside diameter of the first high pressure conduit (20) and an inside diameter of the first low pressure conduit (24), a second space (30) defined between an outside diameter of the second high pressure conduit (22) and an inside diameter of the second low pressure conduit (26); and

means (32) for controlling the pressure level in the first and second spaces (28,30) to a predetermined maximum pressure level upon the failure of one of the first and second high pressure conduits (20,22).

4,425,759

HYDROSTATIC DRIVE SYSTEMS

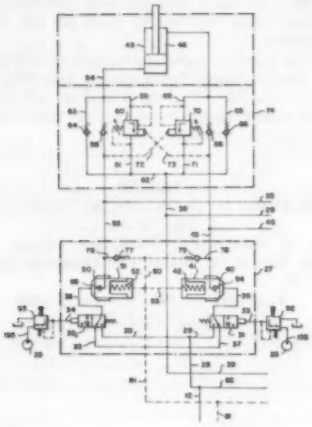
Alfred Krusche, Johannesberg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 324,408

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044144

Int. Cl.³ F16D *31/02*

U.S. Cl. 60—420 29 Claims



1. In a hydrostatic drive system with an adjustable pump, whose adjusting element is connected with an adjustable pump piston capable of sliding in an adjustable pump cylinder, the position of the piston which is determined by a pressure medium controlled by a servo control valve, at least one consumer of hydrostatic energy in the drive system and a delivery line between the pump and the consumer of hydrostatic energy, as well as a return line leading to the tank, and where several consumers are connected through one branch line each to the delivery line coming from the pump, an arbitrarily actuatable switching element located in each branch line, the improvement comprising in combination:

(a) an adjustable parallel-connecting restrictor located in each branch line, an adjustable element in each said restrictor, the adjusting element of each of said parallel-connecting restrictors being loaded on one side by the pressure in one of the delivery line or the branch delivery line and on the other side by a control pressure and a spring; and

(b) means providing a common control pressure at all the parallel-connecting restrictors on one side of the adjusting element, said one side of the adjusting element being connected through a branch control pressure line to a common control pressure line, and a check valve opening toward the common control pressure line located in each branch control pressure line.

4,425,760

BRAKE BOOSTER WITH REACTION DISC PLATE AND CYLINDRICAL MEMBER

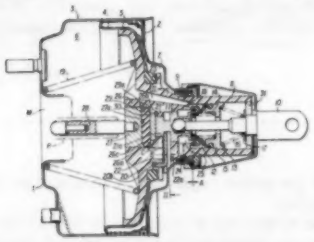
Yoichi Furuta, Chiryu, Japan, assignor to Aisin Seiki Company, Limited, Kariya, Japan

Filed Nov. 13, 1980, Ser. No. 206,394

Claims priority, application Japan, Nov. 14, 1979, 54-158484[U]

Int. Cl.³ F15B *9/10*; B60T *13/00*

U.S. Cl. 60—547.1 5 Claims



1. A brake booster for an automobile including a brake master cylinder and a brake pedal comprising:

a housing;

power piston means including a central cylindrical portion and a diaphragm disposed within said housing;

a vacuum source;

first and second chambers having a first passage therebetween and divided within said housing by said power piston means, said first chamber being continuously connected to said vacuum source, said second chamber being alternatively connected to said first chamber and to atmospheric pressure;

output means connected to said power piston means for actuating said brake master cylinder in response to movement of said power piston means;

control valve means disposed in said first passage between said first and second chambers for controlling communication therebetween;

air valve means including a second passage formed between said second chamber and atmosphere and a valve for controlling communication therebetween;

a push rod operatively connected to said brake pedal for controlling on-off operation of said control valve means and said air valve means, said push rod being connected to said brake pedal;

said central cylindrical portion of said power piston forming a bore with a rounded end corner surface;

wherein said output means further comprise:

a cylindrical member slidably disposed in said bore of said central cylindrical portion,

a reaction disc plate disposed in said bore of said central cylindrical portion, one side surface of said reaction disc plate being in contact with an end surface of said bore of said central cylindrical portion and an opposite surface thereof being in contact with an end surface of said cylindrical member;

wherein each of said side surfaces of said reaction disc plate further comprises a rounded surface complementary to said rounded end corner surface of said bore of said central cylindrical portion, and wherein said end surface of said cylindrical member further comprises a rounded surface complementary to said rounded surface of each side surface of said reaction disc plate and which is in full surface contact with one of said side surfaces of said reaction disc plate.

4,425,761

TURBOCHARGED DIESEL ENGINE WITH THROTTLED REGULATION

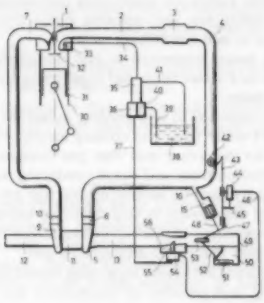
Imre Annus, Budapest, Hungary, assignor to Autóipari Kutató Intézet, Budapest, Hungary

Continuation of Ser. No. 51,968, Jun. 25, 1979, abandoned. This application Jul. 1, 1981, Ser. No. 279,266

Claims priority, application United Kingdom, Jun. 26, 1978, 27881/78

Int. Cl.³ F02B 37/12

U.S. Cl. 60—611 3 Claims



1. A turbocharged engine system, comprising:

a Diesel engine having a plurality of cylinders, an intake manifold connected with at least some of said cylinders, an exhaust manifold connected with all of said cylinders, an exhaust duct connected with said exhaust manifold, air-feed means connected with said intake manifold and constructed and arranged to deliver air to all of said cylinder, and a rated r.p.m.;

a turbocharger for said engine comprising a turbine connected to said exhaust duct and driven by all of the exhaust gas from said engine, and a compressor having an air outlet communicating with said air-feed means, and an air intake communicating with the atmosphere, said turbocharger being dimensioned, constructed and arranged to provide fully the fresh air requirement of said engine at full load and about half said rated r.p.m. with an air pressure approaching a maximum permissible supercharging pressure corresponding to permitted peak combustion pressure, said turbocharger further being constructed and arranged to have an air delivery greater by at most 10% than said fresh air requirement at said rated r.p.m.;

a throttle valve in said air intake having a shiftable member; and

a pressure sensor responsive to the pressure in said intake manifold and connected to said member as a means for controlling same, said pressure sensor having a threshold pressure below which said throttle valve is fully open and above which said throttle valve is closed progressively with increasing pressure in said intake manifold, said threshold pressure corresponding to a preset nominal permissible supercharging pressure, said air intake being provided with a fuel gasifier between said throttle valve and said compressor, a temperature-sensing element disposed in said air-feed means, a spring biasing said throttle valve toward a fully open position, said pressure sensor operating against the effect of said spring, and means connecting said element to said throttle valve for displacing same against the force of said spring, the last-mentioned means and said pressure sensor being constructed and arranged to enable whichever of them provides the greatest throttling operative effect to be operative upon said throttle valve at any given time.

4,425,762

METHOD AND SYSTEM FOR CONTROLLING BOILER SUPERHEATED STEAM TEMPERATURE

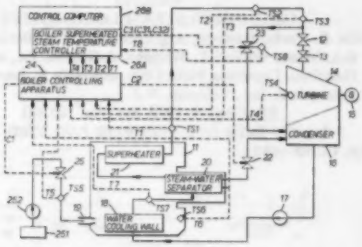
Hidekazu Wakamatsu, Kodaira, and Yoichiro Kogure, Tama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Apr. 27, 1982, Ser. No. 372,339

Claims priority, application Japan, Apr. 28, 1981, 56-63432

Int. Cl.³ F01K 13/02

U.S. Cl. 60—646 16 Claims



1. A method for controlling boiler superheated steam temperature in a power plant having a boiler for generating superheated steam at an outlet thereof, a turbine having an inlet coupled to the boiler to be rotated by the superheated steam generated within the boiler, an electric generator coupled to the turbine for generating electric power, a condenser for condensing the superheated steam spent within said turbine, a water-feed pump for feeding water from the condenser into said boiler, a main steam stop valve disposed between said boiler and said turbine for stopping the superheated steam flowing into said turbine, a turbine bypass valve connected in parallel with the main steam stop valve and said turbine for leading the superheated steam generated within said boiler into said condenser, a first sensor for detecting a first process quantity indicative of the superheated steam temperature at said boiler outlet, a second sensor for detecting a second process quantity indicative of the superheated steam pressure, a third sensor for detecting a third process quantity indicative of the temperature at the turbine inlet, a fourth sensor for detecting a fourth process quantity indicative of a start-up mode of said turbine, and a fifth sensor for detecting a fifth process quantity indicative of opening of said turbine bypass valve, comprising the steps of:

calculating a first mismatch temperature value of said turbine on the basis of said second process quantity, said third process quantity and said fourth process quantity;

calculating a second mismatch temperature value capable of leading the superheated steam into said turbine on the basis of said fourth process quantity;

comparing the first mismatch temperature value with the second mismatch temperature value;

calculating an open-direction drive quantity of said turbine bypass valve on the basis of said fourth process quantity when it is judged that the first mismatch temperature value is less than the second mismatch temperature value;

calculating a closed direction drive quantity of said turbine bypass valve on the basis of the first mismatch temperature value when it is judged that the first mismatch temperature value exceeds the second mismatch temperature value;

calculating a change rate of said first process quantity, comparing the calculated change rate with a predetermined change rate, and producing a first lock signal when said calculated change rate is smaller than the predetermined change rate;

calculating a difference between said first process quantity and said third process quantity, comparing the calculated

difference with a predetermined value, and producing a second lock signal when said calculated difference is smaller than said predetermined value;

outputting an open-direction operation command signal of said turbine bypass valve on the basis of said open-direction drive quantity, said first lock signal said second lock signal; and

outputting a close-direction operation command signal of said turbine bypass valve on the basis of said close-direction drive quantity and said fifth process quantity.

4,425,763

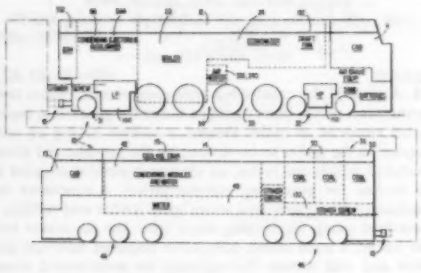
COAL-FIRED STEAM LOCOMOTIVE

Livio D. Porta, Banfield, Argentina; David A. Berkowitz, Natick, Mass.; William L. Withuhn, Arlington, Va., and Carl C. Hamilton, Cuyahoga Falls, Ohio, assignors to American Coal Enterprises, Inc., Lebanon, N.J.

Filed Sep. 9, 1980, Ser. No. 185,601

Int. Cl.³ B61B 1/12, 9/28; F23B 1/10; F28B 7/00

U.S. Cl. 60—693 27 Claims



1. A locomotive comprising:

a water tank holding a quantity of water;

means for generating steam;

first conveying means for conveying said water from said tank to said steam generating means for conversion to steam;

steam engine means for converting said steam into a mechanical motion, said steam engine means releasing portions of said steam during said conversion;

second conveying means for conveying said steam from said steam generating means to said steam engine means;

means responsive to said mechanical motion produced by said steam engine means for causing said locomotive to move in a desired direction;

third conveying means for conveying water from said water tank;

steam conveying means for conveying said released steam from said steam engine;

condensing means, operative to receive water from said third conveying means and to receive said released steam from said steam conveying means, for condensing said released steam by intermingling said steam with said water from said water tank;

cooling means for cooling water passed therethrough;

fourth conveying means for conveying said water from said condensing means to said cooling means; and

fifth conveying means for conveying said cooled water from said cooling means to said water tank.

18. A locomotive comprising:

a water tank for holding a quantity of water;

furnace means for producing flue gas from coal, said flue gas containing particles of combustion;

steam producing means receiving said flue gas containing particles of combustion for producing steam;

means for conveying said flue gas containing particles of combustion to said steam producing means;

means for conveying said water from said water tank to said steam producing means;

cylinder means including at least one piston for converting said steam into a reciprocating mechanical motion of said piston, said cylinder means releasing portions of said steam during said conversion;

means for conveying said steam from said steam producing means to said cylinder means;

means connected to said piston and responsive to said reciprocating motion produced by said piston for causing said locomotive to move in a desired direction;

condensing means, receiving said released steam from said cylinder means, for converting said steam to water;

means conveying said released steam from said cylinder means to said condensing means;

cooling means connected to said condensing means to receive said water from said condensing means for cooling said water;

means connected to said cooling means for conveying said cooled water from said cooling means to said water tank;

means for receiving said flue gas containing particles of combustion from said steam producing means;

separating means for separating said flue gas from said particles of combustion in said receiving means;

means connected to said separating means for releasing said separated flue gas to atmosphere; and

means connected to said separating means for collecting and storing said particles of combustion for subsequent disposal.

4,425,764

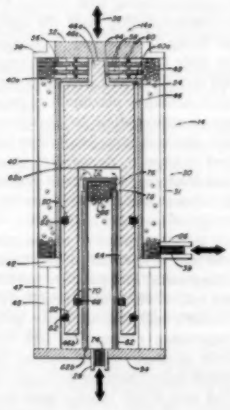
MICRO-CRYOGENIC SYSTEM WITH PSEUDO TWO STAGE COLD FINGER, STATIONARY REGENERATIVE MATERIAL, AND PRE-COOLING OF THE WORKING FLUID

Calvin K. Lam, Bedford, N.H., assignor to Kryovacs Scientific Corporation, Amherst, N.H.

Filed Mar. 16, 1982, Ser. No. 358,620

Int. Cl.³ F25B 9/00

U.S. Cl. 62—6 14 Claims



1. In a miniature cryogenic system having a compressor with two outlets, first and second conduits carrying a working fluid each connected at one end to the outlets pressurized in a split phase relationship by said compressor, wherein the improvement comprises:

an elongated housing having a first end that includes a surface oriented generally transversly to said housing that is cryogenically cooled and a second end opposite said first end;

a displacer located within said housing with its longitudinal axis generally aligned with that of said housing;

means for mounting said displacer for a longitudinal reciprocating movement, said displacer having a first end adjacent said first end of said housing that together with said first housing end defines a first working volume and a second end spaced longitudinally from said first end that together with said second housing end defines a second volume;

first fluid inlet means located in said housing and in fluid communication between said first conduit and said first working volume;

second fluid inlet means located in said housing and in fluid communication between said second conduit and said second volume;

means for restricting the flow of said working fluid between said first and second volumes; and

a stationary regenerative material located in the flow path of said working fluid from said first inlet to said first volume.

4,425,765

AIR CONDITIONER FOR AUTOMOBILES

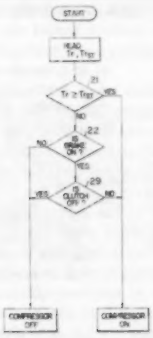
Toshihiko Fukushima, Shimoinayoshi; Seigo Miyamoto, Takahagi; Kenichi Kawashima, Shimoinayoshi; Toshiaki Kawabata, Tokyo; Seijiro Tani, Nakamachi, and Takanori Shibata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,535

Claims priority, application Japan, Nov. 12, 1980, 55-158291

Int. Cl.³ B60H *3/04*; F25B *1/00*

U.S. Cl. 62—133 **6 Claims**



1. An air conditioner for automobiles having a compressor adapted to be driven by an automobile engine, a condenser connected to the high-pressure side of said compressor, orifice means connected to the condenser and an evaporator connected to the low-pressure side of said compressor, said compressor, condenser, orifice means and said evaporator in combination constituting a refrigeration cycle, characterized by comprising: means for detecting the temperature in the passenger's compartment of said automobile; means for setting the optimum temperature in said compartment; and means for detecting the braking state of said automobile; wherein said compressor is driven during braking of said automobile even when the temperature in said compartment is still lower than the set temperature, thereby to operate said refrigeration cycle to store the cold; and further comprising means for detecting the state of the clutch of the power transmission system of said automobile, whereby said compressor is stopped when said clutch is turned off even when said automobile is being braked while said temperature in said compartment is lower than said set temperature.

4,425,766

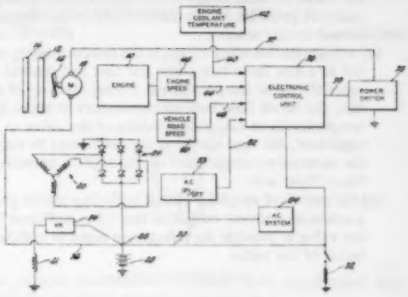
MOTOR VEHICLE COOLING FAN POWER MANAGEMENT SYSTEM

George M. Claypole, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 17, 1982, Ser. No. 378,996

Int. Cl.³ B60H *3/04*; F01P *7/02*

U.S. Cl. 62—133 **8 Claims**



1. A power control system for controlling the voltage applied to an electric motor that drives a cooling fan operative to direct cooling air over a vehicle mounted radiator and the air conditioning condenser of a vehicle air conditioning system comprising, a source of voltage, voltage control means connected between said voltage source and said motor for controlling the voltage applied to said motor, said voltage control means capable of varying the voltage applied to the motor between at least a first low value and a second higher value, means responsive to engine coolant temperature for causing said voltage control means to energize said motor at said second higher voltage value when engine coolant temperature exceeds a predetermined value, and means responsive to an energized condition of the air conditioning system, to vehicle road speed below a predetermined value and to engine coolant temperature below a predetermined value for causing said voltage control means to energize said motor at said first low voltage value.

4,425,767

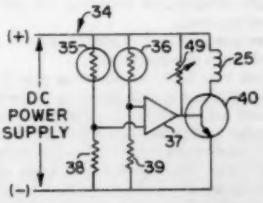
REFRIGERATION CONTROL SYSTEM FOR MODULATING ELECTRICALLY-OPERATED EXPANSION VALVES

William J. Barbier, St. Louis, Mo., assignor to Sporlan Valve Company, St. Louis, Mo.

Division of Ser. No. 80,398, Oct. 1, 1979, Pat. No. 4,362,027, which is a continuation-in-part of Ser. No. 865,903, Dec. 30, 1977, abandoned. This application Aug. 4, 1982, Ser. No. 405,033

Int. Cl.³ F25B *41/00*; F16K *15/00*

U.S. Cl. 62—212 **9 Claims**



1. In a refrigeration system including a compressor, a condensor, and an evaporator operatively connected, the system comprising:

(a) a modulating, electrically operated expansion valve connected to the inlet of the evaporator,

(b) first and second temperature-responsive electrical sensors, the first sensor being positioned to respond to the temperature of liquid refrigerant expanded to suction pressure, and the second sensor being positioned to respond to suction line sensible temperature,

(c) an electrical amplifier circuit connecting the sensors to the valve for modulation of the opening and closing of the valve in response to the differences in the temperatures sensed by the sensors,

(d) refrigerant-bleeding means in the system feeding refrigerant at a low flow rate when the first and second sensors sense the same temperature as during start-up of the system, the bleed flow causing the sensors to sense different temperatures to cause modulation of the valve to control superheat, the first sensor being positioned to respond to the saturation temperature of the suction pressure of the bleed flow, and

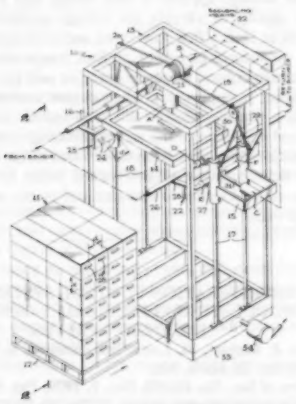
(e) the electrical amplifier circuit including means providing a minimum current output to the valve sufficient to open the valve to provide the refrigerant bleed to initiate modulation of the valve.

4,425,768

ICING APPARATUS FOR PALLET SUPPORTED CARTONS

Daniel E. Burns, Camarillo, Calif., assignor to Demco, Inc., Oxnard, Calif.

Filed Sep. 30, 1982, Ser. No. 432,079
Int. Cl.³ F25D 15/00
U.S. Cl. 62—237 6 Claims



1. An apparatus for icing a plurality of cartons of perishable food stacked in rows and columns on a pallet, including, in combination:

(a) a frame structure for receiving said pallet with cartons stacked thereon;

(b) at least one carriage mounted to one side of said frame for up and down movement; and,

(c) at least two liquid ice injecting probes in horizontally spaced relationship corresponding to the spacing between the hand hold openings in adjacent cartons in a row on said pallet, said probes being mounted to said carriage for in and out movement towards and away from said cartons on said pallet whereby cartons in a row on said pallet can be simultaneously iced by injecting ice from said probes after moving the probes inwardly to pass through said hand hold openings in adjacent cartons, and whereby thereafter, the probes can be withdrawn and said carriage moved in a vertical direction to position the probes for reception in the hand held openings of the next cartons vertically spaced from the first mentioned cartons in said columns of cartons so that when inward movement is again effected, the next cartons can be iced.

4,425,769

METHOD FOR TREATING A GEM AND GEM TREATED WITH THIS METHOD

Maurice Hakoune, Belgiëlei, 147, Antwerp, Belgium

Filed May 6, 1982, Ser. No. 375,663
Claims priority, application Belgium, May 7, 1981, 204718
Int. Cl.³ C23C 15/00; A44C 17/00
U.S. Cl. 63—32 12 Claims

1. A method for treating a gem stone to provide it with a marking on the surface thereof in order to permit identification thereof, wherein a photoresist resin is secured to the stone; a photographic film bearing the desired marking pattern is applied over said resin; said resin is developed by exposing same to a light source; the exposed portions of said resin, as well as said film, are removed; and the stone is then subjected to cathode bombardment in such a way that etching of the stone occurs at those locations which are not protected by said resin.

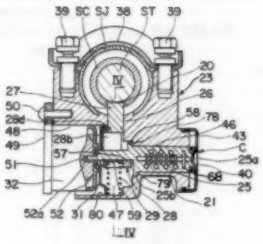
12. A gem stone bearing a marking as obtained with the method as defined in claim 1.

4,425,770

STEERING LOCK ASSEMBLY

Akiyoshi Mentani, c/o Yuhshin Co., Ltd. (Hiroshima Factory), 1269, Dairiki, Higashikaita, Kaita-cho, and Hiromasa Nakamoto, c/o Toyo Kogyo Co., Ltd., 3-1, Shinchi, Fuchu-cho, both of Aki-gun, Hiroshima-ken, Japan

Filed Apr. 6, 1981, Ser. No. 251,282
Claims priority, application Japan, Apr. 5, 1980, 55-44921
Int. Cl.³ B60R 25/02; E05B 29/02, 65/12
U.S. Cl. 70—252 9 Claims



1. A steering lock assembly which comprises, in combination:

a lock housing having a cylindrical portion with an unobstructed axial bore therein and opening out of the opposite ends of said cylindrical portion, and a generally U-shaped mounting portion extending generally laterally away from the cylindrical portion and having a guide opening therein in communication with said axial bore, one portion of said axial bore at one end thereof being a plug accommodating portion and having a diameter smaller than that of the remainder of said axial bore, and said cylindrical portion having a radially extending shoulder between said smaller diameter bore portion and the remainder thereof;

a locking member movably supported in said guide opening and movable between locking and unlocking positions for locking and unlocking an automobile steering shaft and having the end toward said axial bore extending into said axial bore when said locking member is in the locking position and being movable toward said axial bore to the unlocked position;

a plug operatively housed in said smaller diameter portion of said axial bore and having one end at said one end of said

cylindrical portion, and a cam member integral with said plug at the other end of said plug, said plug having an axially extending key groove therein for receiving a mating key, said plug being rotatable together with said cam member through a predetermined angle between inoperative and operative positions around the longitudinal axis thereof only when the mating key inserted in said key groove is turned, said plug including means engagable with said cylindrical portion for blocking rotation of said plug in the absence of the mating key in the key groove and permitting rotation of said plug after insertion of the mating key in the key groove, said blocking means having the capability of discriminating whether or not the mating key inserted in the key groove is correct and acceptable to the plug and accepting only the correct and acceptable key;

a slide member movably mounted in said axial bore at a position aligned with said guide opening for movement transversely of the axis of said bore between locked and unlocked positions, said slide member being laterally movable into said axial bore from the other end thereof and having coupling means for coupling with said locking member in response to such lateral movement for, when moved between said locking and unlocking positions, driving said locking member to lock and unlock the steering shaft, said cam member engaging said slide member for moving said slide member from the locked position towards the unlocked position in response to rotation of said plug from the inoperative position towards the operative position;

means for biasing the slide member toward the locked position for moving said slide member from the unlocked position toward the locked position in response to the rotation of said plug from the operative position towards the inoperative position;

a key operated electric switch means housed in the axial bore adjacent the other end of said cylindrical portion, said electric switch means being insertable into said axial bore from said other end thereof and being capable of assuming at least first and second switching positions when the plug is in the inoperative and operative positions, respectively, said cam means being connected to said electric switch means for moving said electric switch means between switching positions in response to movement of said plug between inoperative and operative positions;

a rocking pawl rockably mounted in a chamber of said housing contiguous to said axial bore for rocking movement radially of said plug and in a plane perpendicular to the path of movement of said slide member and having one end directly engaged with said slide member when said rocking pawl is rocked to an operative position and said slide member is moved to the unlocked position for blocking movement of said slide member and said locking member to the locked position and key actuated means movably mounted in said plug for engaging the other end of said rocking pawl for moving said rocking pawl to said operative position in response to insertion of the key in said key groove and holding said rocking pawl in said operative position until said key is removed from said key groove;

a stop projection integral with said plug and protruding radially outwardly from one end of said plug and engaged with said shoulder when said plug is in position in said smaller diameter portion of said bore for blocking axial movement of said plug in a direction toward said one end of said cylindrical portion; and

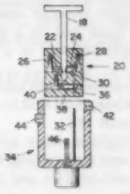
retaining means for retaining said plug from being axially displaced in a direction toward said other end of said cylindrical portion.

4,425,771

COMBINED MAGNETIC AND NON-MAGNETIC LOCKING MECHANISM

Russell J. Beach, 2113 W. 177th St., Torrance, Calif. 90504; Jess R. Bateman, 1516 Esplanade Ave., Redondo Beach, Calif. 90277, and Robert L. Carpenter, 12,032 Freeman Ave., Hawthorne, Calif. 90250

Filed Apr. 13, 1981, Ser. No. 253,248
Int. Cl.³ E05B *35/04, 47/02;* E05C *17/56*
U.S. Cl. 70—276 **6 Claims**



1. A release mechanism including both mechanical and magnetically operated detents comprising:

two interlocked members;

a non-magnetic detent or latch means for holding said two members together;

a mechanical release means for physically moving said non-magnetic detent or latch means;

a magnetic element for blocking the operative movement of said mechanical release means;

magnetic means for shifting said magnetic blocking element to unblock said mechanical release means as it reaches said magnetic blocking element;

key assembly means for supporting and mounting said mechanical release means; and

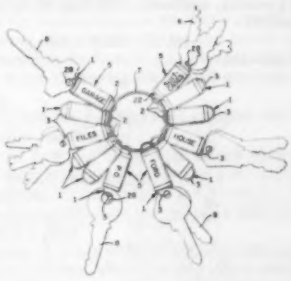
said key assembly means being hollow.

4,425,772

KEY LABELING SYSTEM

Robert A. Brewer, 15 Castle Park Way, Oakland, Calif. 94611

Filed Sep. 29, 1981, Ser. No. 306,709
Int. Cl.³ A47G *29/10*
U.S. Cl. 70—456 R **1 Claim**



1. A method of labeling, filing and carrying keys comprising:

a. selecting a connector member having:

1. a single wire having first and second ends, bent to a configuration lying generally within a single plane and consisting of a mid-portion with generally straight and parallel portions of said wire and a single loop end on one side of said mid-portion and a double loop end on the other side of said mid-portion;

2. said wire member consists of:

(1) a first straight member inclined inwardly of said mid-portion and terminating in a first distal end

within said mid-portion and adjacent to said single loop end,

(2) a first loop portion connected to said first straight portion bent on a curve of about 180° and forming one of said loops of said double loop end;

(3) a second straight member connected to said first loop portion on a line spaced from said first straight member,

(4) a second loop connected to said second straight member bent on a curve of about 180° and forming said single loop end,

(5) a third straight member connected to said second loop spaced from and on a line convergent to said second straight member in a direction toward said first loop,

(6) a third loop connected to said third straight member genrally overlying said first loop member and bent on a curve of about 180°,

(7) a fourth straight member inclined inwardly of said mid-portion and terminating in a second distal end within said mid-portion and adjacent to said single loop end; and

said wire is bent so that said second and third straight members converge slightly in the direction of said double loop end so that the first perimeter distance at the junction of said first and third loops with said straight members is substantially equal to the second perimeter distance at the junction of said second loop with said straight members

b. selecting an elongated, non-abrading, parallel sided sleeve member frictionally removably affixed and surrounding said wire and substantially covering said straight mid-portion and said wire ends whereby one loop end is uncovered and is adapted for connection to a key and the sleeve separates the other loop end which is uncovered and is adapted for connection to a split ring

c. selecting indicia means adapted for attachment to said sleeve member;

d. selecting a split ring and releasably attaching said ring to said second loop portion of said connector member.

4,425,773

APPARATUS FOR WINDING HELICAL WIRE COILS

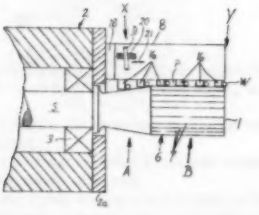
Paul Fabrig, Neuffen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,792

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043271

Int. Cl.³ B21F *3/04*

U.S. Cl. 72—142 11 Claims



1. Apparatus for converting a length of wire into a helical coil of predetermined pitch, comprising a rotary coiling mandrel; a plurality of substantially pin shaped wire guiding elements adjacent to the periphery of the mandrel and distributed in accordance with the pitch of the coil to be wound so as to define a helical path having an inlet and an outlet, said elements being rotatable about their respective axes and such axes being slightly offset with reference to radial positions relative to said mandrel; and means for supplying the wire into the inlet of said path whereby the rotating mandrel advances the wire along said path and the guiding elements shift the thus formed convolutions of the wire coil axially of the mandrel.

4,425,774

EXTRUSION FORGING METHOD THEREFOR

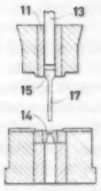
Kichitaro Shinozaki, Ibaraki; Kiyoshi Sato, Tokyo, and Toru Shimizu, Ibaraki, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Sep. 23, 1981, Ser. No. 304,815

Claims priority, application Japan, Sep. 29, 1980, 55-135432

Int. Cl.³ B21C *35/03*

U.S. Cl. 72—257 2 Claims



1. A method for extrusion forging a billet, comprising the steps of:

(a) extruding a billet through a die by applying pressure to the billet held in a container by means of a punch having a length larger than that of said container until an undeformed part of said billet remains within said container, said die being disposed on the leading end of said container;

(b) withdrawing said punch from said container to a predetermined level upon completion of the extrusion;

(c) maintaining said punch at said predetermined level;

(d) reforming the extruded part of said billet by withdrawing said extruded part from said die by moving said container away from said die while holding fast thereto the undeformed part of said billet; and

(e) removing said undeformed part of said billet from said container by moving said container to the predetermined position of said punch so that said punch is inserted into said container by said movement to collide with and exert a pressure upon the upper surface of the undeformed part of the billet remaining within said container, thereby separating from said container the extrusion forged product having its one end connected with the undeformed part of said billet.

4,425,775

METHODS FOR EXTRUSION

Francis J. Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Co., New York, N.Y.

Division of Ser. No. 926,164, Jul. 19, 1978, Pat. No. 4,319,476. This application Nov. 4, 1981, Ser. No. 318,293

Int. Cl.³ B21C *23/32, 27/00, 33/00*

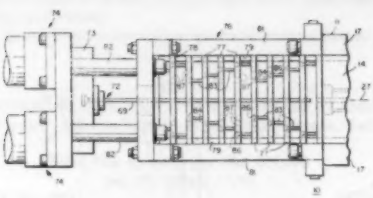
U.S. Cl. 72—270 4 Claims

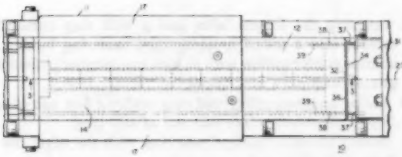
1. In combination with a method of extruding first and second elongated workpieces to form first and second elongated products, respectively, wherein a plurality of gripping members are operatively engaged with the first and second elongated workpieces simultaneously to form respective extrusion chambers thereabout, and wherein the gripping members are so displaced as to advance the operatively engaged, first and second elongated workpieces successively into and through an extrusion station, the additional steps of:

(a) locating between the plurality of gripping members, adjacent to that end of the second elongated workpiece which is closest to the extrusion station, a second die for

replacing a first die, through an aperture of which first die the first elongated workpiece is extruded upon the advance of the first elongated workpiece into and through the extrusion station to form said first elongated product;

(b) causing the first die to be displaced from the extrusion station after the first elongated workpiece has been extruded therethrough;





(c) advancing the second die into the extrusion station, due to said displacement of the plurality of gripping members, ahead of the advance of the second elongated workpiece into the extrusion station; and then

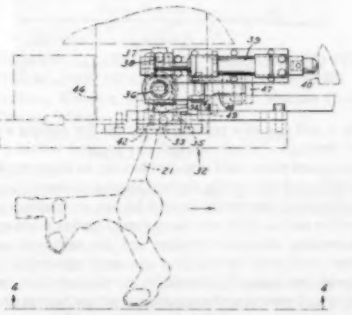
(d) retaining the second die in the extrusion station while the second elongated workpiece is advanced through the extrusion station so as to extrude the second elongated workpiece through an aperture in the second die to form said second elongated product.

4,425,776

PRODUCTION WORKPIECE STRAIGHTENING SYSTEM

Edward E. Judge, Jr., Lansing, Mich., assignor to Industrial Metal Products Corporation, Lansing, Mich.

Filed Oct. 17, 1979, Ser. No. 85,466
Int. Cl.³ B21D *3/16*
U.S. Cl. 72—306 21 Claims



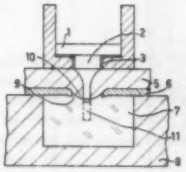
1. A straightening system comprising means for straightening production quantities of workpiece having a plurality of potential distortions including means for immovably clamping said workpiece at a single straightening station in fixed relation relative to said station, separate gauging means for simultaneously gauging the direction and magnitude of each of said distortions, and automatic power operated deflecting means at said station for simultaneously effecting straightening of said distortions, including means for simultaneously moving said deflecting means in a plurality of different planes at said single station thereby straightening said distortions.

4,425,777

METHOD OF AND DEVICE FOR MANUFACTURING A JET NOZZLE PLATE FOR INK JET PRINTERS

Werner Jeglinski, Bönningstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1981, Ser. No. 313,866
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042483
Int. Cl.³ B21D *28/26, 28/14;* B23P *15/16*
U.S. Cl. 72—325 2 Claims



1. A method of manufacturing a jet nozzle plate for ink jet printers by means of a combined press and punch operation with a press mould in the form of a cushion, comprising the steps of:

disposing a jet nozzle plate on a drawing ring of resilient spring steel with the drawing ring having an opening exposing a hard elastic plastic block situated below said drawing ring and extending across said opening;

drawing the jet nozzle plate through said opening of the drawing ring of spring steel by a press and punch die having the internal dimensions of the jet nozzle;

subsequently punching said plate during further drawing in a hard elastic block as the cutting cushion; and

slightly pressing the drawing ring into the plastic block during the press operation such that the perimeter of the drawing ring opening is deflected into the plastic block and the plate material drawn through the opening is given a raised burr-free surface.

2. A device for manufacturing a jet nozzle plate for ink jet printers by means of a combined press and punch operation with a press mould in the form of a cushion, comprising:

a press and punch die having the internal dimensions of the jet nozzle;

said press and punch die having been polished and having a homogeneous hardness;

a press mould having a recess with a hard elastic plastic block filling said recess, whereby said press mould forms a hard backing for said block, said plastic block being made of polyoximethylene and having a thickness of approximately 2 mm;

a drawing ring of spring steel having an opening and constructed as a resilient band overlying and in contact with the hard elastic plastic block plastic block extending across said opening;

said press mould being situated opposite said press and punch die such that when a plate is located on the drawing ring of said press mould and said press and punch die are operated the plate is punched with the plate material being drawn through the opening in said drawing ring and against said plastic block as the drawing ring is deflected about said opening;

the zones of said drawing ring which are subjected to pressure exerted on the die having been polished to be free from hair lines.

4,425,778

METHOD AND TOOL FOR REDRAWING

Josef T. Franek, Chorleywood, and Paul Porucznik, St Albans, both of England, assignors to Metal Box Limited, Reading, England

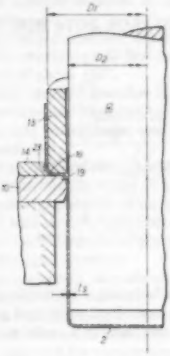
PCT No. PCT/GB80/00184, § 371 Date Jun. 17, 1981, § 102(e) Date Jun. 17, 1981, PCT Pub. No. WO81/01259, PCT Pub. Date May 14, 1981

PCT Filed Oct. 28, 1980, Ser. No. 276,359

Claims priority, application United Kingdom, Oct. 31, 1979, 7937773

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—347 15 Claims



1. A method of redrawing a pre-drawn metal cup having a sidewall of predetermined initial thickness, to increase its length and reduce both its diameter and its thickness, wherein the cup is engaged internally by a punch and by a guide ring coaxially surrounding the punch, and in this condition is urged forward by the punch along the punch axis so that the material of the cup sidewall is progressively urged radially inwardly past a forward face of the guide ring and, subsequently, axially through an annular die having the same axis, the sidewall material of the cup being subjected in turn to:

(i) elastic radially-inward bending around a curved edge of the guide ring and in intimate contact with the guide ring only;

(ii) elastic bending in the reverse direction through an angle substantially greater than 45 degrees but less than 90 degrees, around a curved edge of the die; and

(iii) passing convergently along a convergent bore of the die towards a die throat, whilst the guide ring exerts on the sidewall and an axial pressure sufficient only to guide the sidewall radially past the forward face of the guide ring but insufficient to provide a clamping force, and the sidewall being in contact with only the die throughout steps (ii) and (iii), whereby the thickness of the sidewall is reduced by simple stretching induced by back tension whilst its diameter is reduced by said bending.

4,425,779

METHOD OF MAKING SINGLE OR DOUBLE FLANGED TRACK TRACTOR ROLLER FOR OFF-HIGHWAY EQUIPMENT

Donald J. Diemer, 4355 Brendan La., North Olmsted, Ohio 44070, and Ralph D. Delio, R.D. #1 Susan Trace, New Wilmington, Pa. 16142

Continuation of Ser. No. 2,851, Jan. 12, 1979, Pat. No. 4,294,101. This application Aug. 31, 1981, Ser. No. 297,741

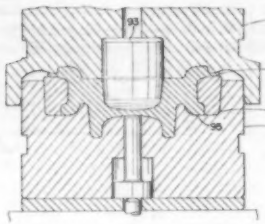
Int. Cl.³ B21D *22/00*; B21K *1/28*

U.S. Cl. 72—356 7 Claims

1. A method of closed die forging to form a flanged cylindrical metal part having at least two exterior cylindrical flanges and a cylindrical cavity which consists of:

A. busting and preforming a heated billet to a cylindrical shape having one end and an axially opposite other end;

B. inserting the billet into a set of dies, said dies having an interior conformation with portions for at least one interior cylindrical groove and a large central cylindrical cavity;



C. inserting the forged billet and a split ring outwardly thereof into a set of finishing dies, said ring having an interior conformation with at least one interior cylindrical groove to form a first flange;

D. mating and supporting said ring within a first one of said dies to effectively close one end of said ring;

E. closing the other end of said ring with the other die to forge said billet; and

F. thereafter removing the split ring and billet together from said finishing dies.

4,425,780

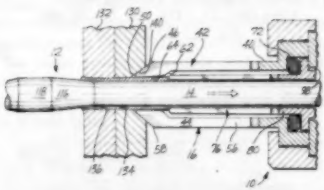
APPARATUS HAVING EXTENDED PRESTRESSING AND SLEEVE RETAINING DEVICES FOR PRESTRESSING COUNTERSUNK FASTENER HOLES AND METHOD

Louis A. Champoux, Seattle, Wash., assignor to Fatigue Technology, Inc., Seattle, Wash.

Filed Feb. 10, 1982, Ser. No. 347,739

Int. Cl.³ B21D *41/02, 39/06*; B21K *21/16*

U.S. Cl. 72—370 41 Claims



1. In a pull gun of a type which is use for pulling a mandrel axially through a prestressing sleeve located within a fastener hole in a workpiece, said mandrel having an inner small diameter portion and outwardly thereof having an increasing diameter portion and outwardly thereof having an increasing diameter portion and an adjacent maximum diameter portion, so that the increasing diameter portion and the adjacent maximum diameter portion of the mandrel can exert expansion forces on the sleeve, to cause the sleeve to be expanded in the radial direction and prestress the metal around the fastener hole, and in that manner improve fatigue properties of the metal,

the improvement comprising:

an axially split expandable countersink prestressing member having a generally central passageway through which the mandrel travels axially as it is being retracted into the pull gun;

an outer end of said member being adapted to engage a

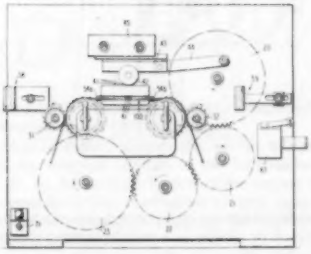
countersink of said fastener hole to prestress the countersink as the mandrel is being retracted through the sleeve;
said prestressing member having an inner end secured in said gun; and
a sleeve retainer having an outer end outwardly of said gun and in said passageway of said prestressing member for retaining said sleeve in said fastener hole when said mandrel is retracted axially through the fastener hole, countersink, and sleeve;
said sleeve retainer having an inner end secured in said gun.

4,425,781

METHOD FOR MANUFACTURING HOSE CLAMPS

Hans Oetiker, Oberdorfstrasse 21, CH-8810 Horgen, Switzerland

Filed Feb. 4, 1981, Ser. No. 231,275
Int. Cl.³ B21D *53/36*
U.S. Cl. 72—379 **15 Claims**



1. A method for manufacturing open hose clamps of the type made from substantially flat springy band material whose open ends are adapted to be mechanically connected with each other by hook means near one band end adapted to engage in aperture means near the other end of the band to permit radial assembly of the clamp about an object to be fastened, comprising the steps of stamping out from band material a substantially flat blank representing the open clamp provided with the hook and aperture means, and preforming the thus-stamped out substantially flat blank by bending each of its free ends into a predetermined generally part-circular configuration to permit the thus preformed blank to spring back to an open shape which facilitates assembly over the object to be fastened by subsequent engagement of the hook means into the aperture means.

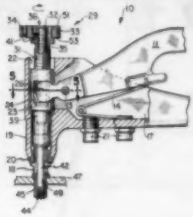
4,425,782

HAND-HELD SETTING TOOL AND METHOD FOR SETTING DEFORMABLE HEAD FASTENERS

Joseph Todisco, Woburn, Mass., assignor to Marson Corporation, Chelsea, Mass.

Filed Dec. 3, 1981, Ser. No. 327,051
Int. Cl.³ B21D *15/34*
U.S. Cl. 72—391 **12 Claims**

1. A hand-held tool adaptable for setting a plurality of types of headed fasteners each of which is set by pulling the fastener to deform the head comprising
(a) a housing including an anvil;
(b) a cavity in the housing;
(c) first and second reciprocatable non-rotatable puller means for selective mounting in the cavity; each puller means capable of pulling at least one type of fastener;
(d) a first handle fixed to the housing;
(e) a second handle slidably engageable with each puller means and pivotably mounted on the housing to move each puller means reciprocally in the housing over a fixed range by manipulation of the handles toward and away from one another;
(f) the first puller means having an internal bore throughout the length of the puller means and a mandrel holder threadedly engageable in the bore of such puller means so that the mandrel holder is movable axially further in and axially further out of the puller means; such mandrel holder having a lower threaded stem portion extending



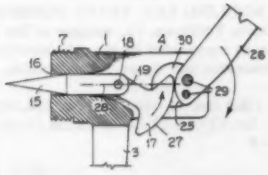
from the cavity of the housing for threaded engagement with the fastener; and
(g) the second puller means adapted to be substituted in the housing cavity for the first puller means; said second puller means having jaw means to releasably grip an unthreaded fastener stem.

4,425,783

TUBE EXPANDING TOOL

Wlodzimierz Rast, North Adelaide, Australia, assignor to Ridge Tool Company, Elyria, Ohio

PCT No. PCT/AU80/00038, § 371 Date Mar. 27, 1981, § 102(e) Date Mar. 27, 1981, PCT Pub. No. WO81/00364, PCT Pub. Date Feb. 19, 1981
PCT Filed Jul. 29, 1980, Ser. No. 247,295
Claims priority, application Australia, Jul. 30, 1979, PD9783
Int. Cl.³ B21D *41/02*
U.S. Cl. 72—393 **8 Claims**



1. A tube expanding tool comprising a body having a first handle secured thereto and a second movable handle pivotally carried thereby and a drift axially slidable therein into expandable jaws carried in a head mountable on the said body whereby to expand the said jaws when the said drift is moved thereinto, characterised by a push rod hingedly connected to said drift about a pin having its axis parallel to the axis of movement of the said second handle, the said push rod having an arcuate face positioned to engage a cam face on said movable handle in a position on, or substantially on, the axis of movement of the said drift, said pin being encircled by a helical spring one end of which connects to the said push rod and the other end of which connects to the said drift, said spring being loaded to move the said push rod into a starting position in relation to the said drift when there is no frictional contact between said cam face and said push rod and allowing progressive forward movement of said drift by successive strokes of said handle which has the said cam on it.

4,425,784

ANGLE INDICATOR ATTACHABLE TO TUBE BENDERS AND THE LIKE

Frank D'Gerolamo, 2730 Bartlett St., Baton Rouge, La. 70805

Filed Jul. 22, 1982, Ser. No. 400,745
Int. Cl.³ B21D 7/14; B21C 51/00
U.S. Cl. 72—459 3 Claims

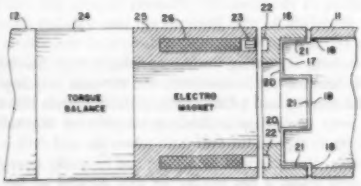
1. An angle indicator for use with a pipe heater having an elongated handle or like device comprising: an arcuate-shaped spirit level fixedly attached to a support base having an arcuate shaped groove of depth and shape sufficient for said spirit level to fit in said groove and having a straight groove running vertically on one side of said base perpendicular to the center of said spirit level on the opposite side of said base, said base having angle indicating markings adjacent said spirit level.

4,425,785

MISSILE ROLLING TAIL BRAKE TORQUE SYSTEM

William T. Davis, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 11, 1982, Ser. No. 338,386
Int. Cl.³ G01N 19/02; G01M 19/00
U.S. Cl. 73—9 9 Claims



1. Apparatus for simulating varying levels of friction between a rotating body and a nonrotating body comprising:

a ring between said rotating body and said nonrotating body;

means for attaching said ring to said rotating body such that said ring rotates with said rotating body and is movable relative to said rotating body in the direction of said nonrotating body; and

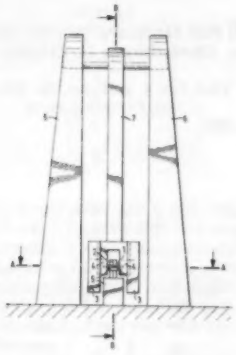
means for moving said ring in the direction of said nonrotating body to make frictional contact with said nonrotating body.

4,425,786

METHOD AND APPARATUS FOR IMPACT TESTING OF BEND SPECIMEN

Erkki Sirkkola, Kirkkonummi, and Heikki Kotilainen, Espoo, both of Finland, assignors to Valtion Teknillinen Tutkimuslaitos, Espoo, Finland

Filed Oct. 6, 1980, Ser. No. 194,132
Claims priority, application Finland, Oct. 10, 1979, 793151
Int. Cl.³ G01N 3/30
U.S. Cl. 73—12 8 Claims



1. A method for testing impact toughness of a bend specimen having a notch or similar in a middle portion thereof, which comprises:

(a) stationarily supporting said specimen in a middle area thereof by said specimen being placed symmetrically in contact against a stationary tup and at the opposite side of the specimen in relation to the notch therein;

(b) hitting the specimen at the notched side simultaneously at two end points positioned on each side of the middle area, so as to bend the specimen around the stationary tup; and

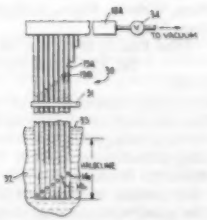
(c) measuring the force exerted by the hit specimen against said tup.

4,425,787

METHOD OF AND APPARATUS FOR MEASURING THE DENSITY PROFILE OF A LIQUID LAYER

Israel E. Saraf, Jerusalem, Israel, assignor to Solmat Systems Ltd., Yavne, Israel

Filed Sep. 15, 1981, Ser. No. 302,576
Int. Cl.³ G01N 9/00, 9/26
U.S. Cl. 73—32 R 10 Claims



1. Apparatus for measuring the density of a liquid comprising a plurality of individual tubes arranged side-by-side, each tube having an inlet aperture in its lower end, and a vacuum manifold connected to the apertured upper ends of the tubes, the lower ends of the tubes being staggered so that, when the tubes are vertically oriented with the lower ends thereof immersed in the liquid, the inlet openings are differently spaced

from the surface of the liquid, whereby liquid from different levels is drawn into the tubes when a vacuum is applied to the vacuum manifold.

4,425,788

COMBUSTION MONITORING SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

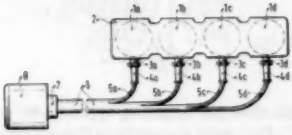
Horst Franke, Löchgau; Ernst Linder, Mühlacker; Winfried Moser, Markgröningen; Klaus Muller, Tamm, and Franz Rieger, Aalen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,407

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1981, 3106993

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 **13 Claims**



1. Combustion monitoring system for a multi-cylinder internal combustion engine (2) comprising

a plurality of optical sensors (4*a*, 4*b*, 4*c*, 4*d*) positioned in optically coupled relation to the combustion chambers (1*a*, 1*b*, 1*c*, 1*d*) of the cylinders of the engine, and providing separate optical combustion sensing signals; and

an evaluation means (8) having the sensing signals applied thereto and including

sensing means (16*a*, 16*b*, 16*c*, 16*d*; 16'*a*, 16'*b*, 16'*c*, 16'*d*) positioned for sensing the respective sensing signals being applied to the evaluation means and providing output signals associated with the respective combustion chambers, and means (13, 14; 19, 20, 30) positively associating the output signals from the evaluation means (8) with the optical sensing signals derived from the optical sensors;

including means (6'; R_L) for combining the separate combustion sensing signals and for forming an output signal available at a single terminal;

and wherein the means (20, 30) for positively associating the output signals with the optical sensing signals comprises scanning or signal steering means (20, 22*a*, *b*, *c*, *d*; 30, 30') synchronized with rotation of the IC engine for temporally separating the combined signals.

4,425,789

MONITORING SYSTEM FOR HYDRAULIC PIPELINES AND/OR ACTUATING DEVICES

Borislav Andreev, Hagen, and Johannes A. Schumacher, Werdohl, both of Fed. Rep. of Germany, assignors to Kracht Pumpen- und Motorenfabrik GmbH & Co. KG, Werdohl, Fed. Rep. of Germany

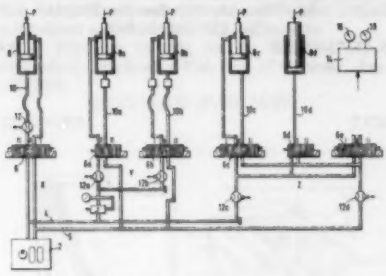
Filed Oct. 9, 1981, Ser. No. 310,355

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038283

Int. Cl.³ G01M *3/26*

U.S. Cl. 73—40.5 R **6 Claims**

1. A monitoring system for a hydraulic installation comprising a volume flow sensor having a toothed rotor similar to that in a toothed rotor motor, wherein the movements of the toothed rotor are sensed by no-contact detectors which emit electrical pulses in response to discrete quantities of liquid displaced and in proportion to the volume of a tooth of the toothed rotor, and a device by which said pulses are processable with respect to the direction of flow through the volume flow sensor and to the pulse frequency, said device comprising counting means for counting said pulses after a predetermined limiting frequency of pulses is exceeded, leak signal producing means for producing a signal indicative of leakiness when a specific predetermined number of successive pulses is reached by said counting means during an uninterrupted counting



period, and means for automatically resetting said counting means each time said specific predetermined number of successive pulses is not reached during an uninterrupted counting period.

4,425,790

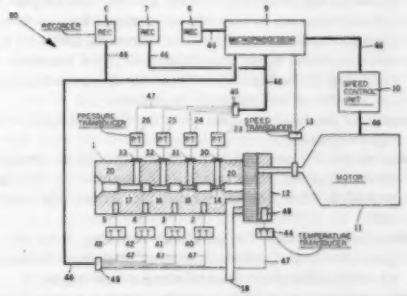
PREDICTION OF EXTRUSION PERFORMANCE OF POLYMERS

William L. Bice, Slaughter; Ernest D. Graves, Jr., and Gerald P. Wagener, both of Baton Rouge, all of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 21, 1981, Ser. No. 332,681

Int. Cl.³ G01N *11/08*

U.S. Cl. 73—55 **8 Claims**



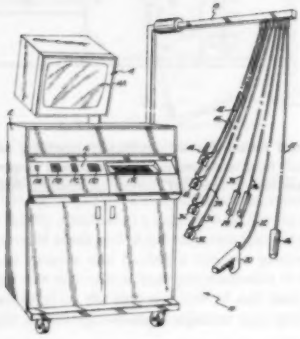
1. An apparatus for predicting the extrusion performance of a thermoplastic resinous polymer, comprising: first, second, and third capillaries in series having substantially the same ratio of passageway length to cross-sectional area, each successive capillary having a larger passageway than that of the immediately preceding capillary; means for forcing the polymer to flow through the capillaries in series at a substantially constant volumetric rate; and means for sensing the pressure drop across the first, second, and third capillaries.

4,425,791

COMPUTER BASED ENGINE ANALYZER WITH HARDWARE CYLINDER COUNTER

Michael J. Kling, Mequon, Wis., assignor to Bear Automotive Service Equipment Company, Milwaukee, Wis.

Filed Dec. 14, 1981, Ser. No. 330,151
Int. Cl.³ G01M 15/00
U.S. Cl. 73—117.3 9 Claims



1. An engine test apparatus for use in testing of a multi-cylinder internal combustion engine, the apparatus comprising:

cylinder clock means for deriving a cylinder clock signal representative of sequential operation of each cylinder of the engine, the cylinder clock signal exhibiting a predetermined signal transition for each cylinder;

a presettable digital cylinder counter for counting down from an initial count (J) to zero in response to the predetermined signal transitions of the cylinder clock signal, the cylinder counter having output terminals for providing a digital cylinder count (Q) which is decremented with each predetermined signal transition, and input terminals for receiving the initial count (J) which is representative of the number of cylinders of the engine;

means for producing a signal when the digital cylinder count (Q) reaches zero;

reset means for resetting the cylinder counter to the initial count (J) at the input terminals in response to the signal provided when the digital cylinder count (Q) reaches zero;

electrical test means for selectively deriving, from the engine, electrical signals indicative of operation of a system or component of the internal combustion engine;

operator input means for providing operator input signals indicative of a selected test to be performed;

display means for displaying visually a test result of the selected test performed; and

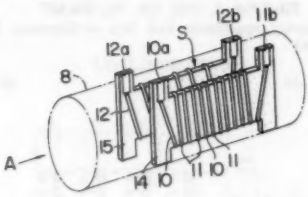
digital computer means for controlling operation of the electrical test means as a function of the operator input signals and the digital cylinder count (Q) and for controlling the display means as a function of the electrical signals from the electrical test means, the digital computer means providing the initial count (J) to the input terminals of the presettable digital cylinder counter.

4,425,792

APPARATUS FOR MEASURING A FLUID FLOW RATE

Tokio Kohama, Nishio; Hideki Obayashi, Okazaki; Hisasi Kawai, Toyohashi, and Tsuneyuki Egami, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 7, 1982, Ser. No. 376,133
Claims priority, application Japan, May 8, 1981, 56-69959; Dec. 26, 1981, 56-212767
Int. Cl.³ G01F 1/68
U.S. Cl. 73—204 8 Claims



1. In a fluid flow rate measuring apparatus for measuring a flow rate of a fluid under measurement flowing through a flow rate measuring tube, said apparatus including an electric heater resistance wire for applying heat to the fluid under measurement, a first temperature dependent resistance wire for detecting a temperature of the fluid heated by said electric heater resistance wire, a second temperature dependent resistance wire arranged at a position, which is not under the influence of the heat from said electric heater resistance wire, to detect a temperature of an unheated portion of the fluid under measurement, and a measuring circuit for applying a voltage to said resistance wires and measuring the flow rate of the fluid, the improvement wherein first and second supporting members each thereof made of an electrical insulating material are arranged within said flow measuring tube, wherein at least two turns of each of said electric heater resistance wire and said first temperature dependent resistance wire are wound on said first supporting member alternately and close to each other but avoiding the occurrence of a short-circuit therebetween, wherein said second temperature dependent resistance wire is wound on said second supporting member, and wherein said first supporting member is arranged within said flow measuring tube in a manner such that the winding direction of said electric heater resistance wire and said first temperature dependent resistance wire wound on said first supporting member makes an angle from 60° to 120° to the direction of the flow of the fluid.

4,425,793

LEVEL GAUGING SYSTEMS

David Turton, and Lionel R. F. Thompson, both of Hatfield, England, assignors to Hawker Siddeley Dynamics Engineering Limited, Hatfield, England

Filed May 26, 1981, Ser. No. 266,869
Claims priority, application United Kingdom, May 29, 1980, 8017506
Int. Cl.³ G01F 23/28
U.S. Cl. 73—290 R 12 Claims

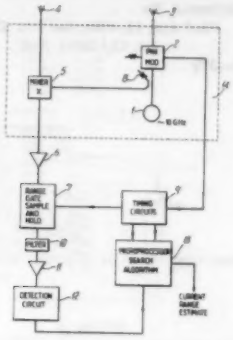
3. Apparatus for measuring the height of a fluent material in a container or bunker, the apparatus comprising:

a microwave source of pulsed radiation adapted to be mounted above or at the top of the container or bunker to project said radiation down on to the surface of the fluent material in the container or bunker;

means for receiving return radiation reflected from said surface; and

means for detecting in the return radiation waveform pulses

that display time-varying amplitudes denoting returns from the flowing surface and for rejecting pulses of fixed



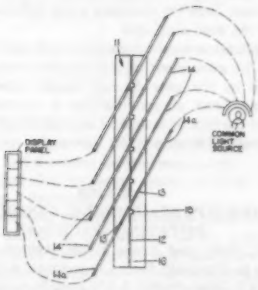
shape denoting returns from fixed parts of the bunker structure.

4,425,794

LIQUID LEVEL INDICATOR

Paul G. Duesbury, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 27, 1981, Ser. No. 258,040
Int. Cl.³ G01F *23/02*
U.S. Cl. 73—293 **9 Claims**



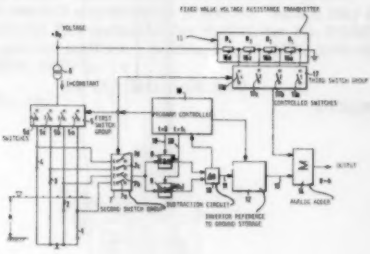
1. A liquid level indicator comprising at least one support element for a plurality of pairs of optical fibers, an elongated opening in said support element extending substantially vertically in use, a plurality of pairs of optical fibers supported at least at their end portions in substantially vertically spaced relationship in said support element with said end portions of each pair in parallel relationship and the end surfaces of said end portions of each pair of fibers being spaced by said opening, said end surface of each end portion being inclined at an acute angle with respect to the axis of said end portion and said end surfaces of each pair being parallel with respect to each other and substantially flush with the walls of said opening, so that when liquid, the level of which is being monitored, flows into said opening transmission of light from one fiber to the other fiber of each pair of fibers across said opening is substantially prevented if the liquid does not fill the region of said opening between said end surfaces of said pair of fibers and said light is transmitted if said region is filled with said liquid.

4,425,795

DEVICE FOR THE ELECTRIC MONITORING OF THE LEVEL OF A LIQUID CONTAINED IN A CONTAINER

Klaus Albrecht, Liederbach, and Martin Haub, Steinbach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 273,159
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022398
Int. Cl.³ G01F *23/00, 23/24*
U.S. Cl. 73—295 **7 Claims**



1. In a device for the electric monitoring of the level of a liquid contained in a container, comprising at least one temperature-dependent resistance sensor immersed in the liquid, the level of which is to be monitored, a source of constant current connectable to the resistance sensor under the control of a program control means controlling a means for detecting and storing the initial voltage drop on the resistance sensor at an initial time and a further voltage drop on the resistance sensor at a specified time after connection of the source of constant current, and means for evaluating said voltages by subtracting the further voltage from the initial voltage to form a display voltage which corresponds to the level of the liquid, the improvement comprising

a temperature-dependent resistance sensor unit comprising a plurality of oblong resistance sensors which includes said at least one sensor, said plurality of sensors being arranged at different levels within the container, said resistance sensors being connected one to the other, and wherein each connecting point as well as the free end of the first and of the last resistance sensor are connected to leads, respectively,

said program control means connecting said resistance sensors one after the other to the source of constant current and to said means for evaluating the voltage drop thereon,

a fixed-value storage means for supplying fixed-value voltages corresponding to differing depths of submerged sensors, each one of which fixed value voltages is selectably dependent on the respective one of said resistance sensors which is partially immersed at the time,

said program control means including means responsive to an evaluation of voltage drops by said evaluating means for substituting a fixed-value voltage from said fixed-value storage means in place of a sum of values of voltage from said evaluating means for such ones of said resistance sensors which are totally immersed, and

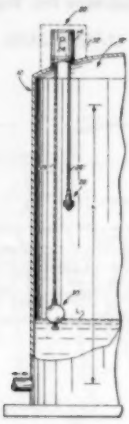
adder means for forming the display voltage by adding an evaluated voltage from said evaluating means corresponding to the depth of immersion of said partially immersed resistance sensor with one of said fixed-value voltages which corresponds to the height of said partially immersed resistance sensor.

4,425,796

HERMETICALLY SEALED TANK GAUGE APPARATUS

Harry Boucher, 1410 E. 6th, Odessa, Tex. 79762, and Jack L. Hubbard, P.O. Box 600, Gardendale, Tex. 79758

Filed Dec. 20, 1982, Ser. No. 450,821
Int. Cl.³ G01F 23/10
U.S. Cl. 73—312 3 Claims



1. Hermetically sealed safety apparatus for measuring volumetric changes of a liquid contained within a tank comprising:

a sensor device, a recorder apparatus;

said sensor device includes a cylindrical housing affixed to a wall of the tank, a wheel rotatably mouned within said housing, a flexible chain, a float device connected to one end of the chain and a counterweight connected to the other end of the chain;

said float device is a hollow sphere having a removable weight affixed thereto to thereby enable the buoyance thereof to be adjusted so that the liquid level of the tank is located near the equitorial plane of the sphere;

a medial length of the chain engages and rotatably drives said wheel, a drive shaft, means by which said drive shaft is journaled to the housing, means by which said drive shaft is connected to be rotated by said wheel so that rotational motion of said drive shaft provides a signal for said recorder;

a marginal length of the said drive shaft extends through a wall of the housing, seal means between said marginal length of said shaft and the housing;

means hermetically sealing the housing to the tank so that any gaseous phase contained within the tank is isolated from ambient;

said recorder apparatus includes a main housing and a drum, means on said drum for continuous recording of data related to the liquid level contained within the tank; a threaded shaft means journaled respective to said main housing, a scribe, a nut means threadedly engaging said threaded shaft for driving said scribe, and means connecting said drive shaft to said threaded shaft so that vertical movement of said float in response to change in the liquid level rotates said wheel, which rotates said drive shaft, which rotates said threaded shaft and causes said scribe to move along the drum;

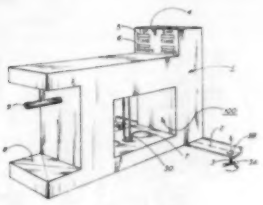
a framework attached to the tank, said recorder apparatus is supported by said framework, an enclosure means removably affixed to said framework and enclosing said sensor device and recorder apparatus therewithin, so that said sensor device and said recorder apparatus cannot be tampered with until the enclosure means is removed.

4,425,797

STRENGTH TESTING GAME SYSTEM USING A CAN

David J. Morrison, Pensacola, Fla., assignor to Crusher Corporation, Richmond, Va.

Filed Jun. 11, 1981, Ser. No. 272,730
Int. Cl.³ G01L 5/02
U.S. Cl. 73—379 16 Claims



1. A strength testing system for allowing a person to test his/her arm strength, comprising:

a frame;

moveable handle means located on and attached to said frame for grasping and moving by the user;

an elbow area associated with said frame located below said handle means, the user putting his/her elbow in the elbow area and grasping said handle means when the system is in use, said handle means being moveable from an upper position down to a lower position at a level comparable to and to the side of the elbow area;

at least one can crusher station associated with said frame, each said can crushing station including

a base area associated with it and against which a can is locatable and moveable, and

can crushing head means moveable under force toward the base area for crushing a can positioned between it and the base area; and

force application means associated with said frame for translating the movement of said handle means and the force exerted by the user on said handle means to said can crushing head means, causing it to move with force toward the base area against any can located between said can crushing head and the base area.

4,425,798

APPARATUS FOR DIAGNOSING ABNORMALITIES IN ROTATING MACHINES

Isao Nagai, Kobe, and Kenzo Wada, Ashiya, both of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

PCT No. PCT/JP81/00055, § 371 Date Nov. 12, 1981, § 102(e) Date Nov. 12, 1981, PCT Pub. No. WO81/02785, PCT Pub. Date Oct. 1, 1981
PCT Filed Mar. 13, 1981, Ser. No. 321,172
Claims priority, application Japan, Mar. 26, 1980, 55-39521; Apr. 2, 1980, 55-43974
Int. Cl.³ G01M 1/22, 13/00; G01N 29/00
U.S. Cl. 73—659 10 Claims

5. An apparatus for detecting abnormalities in rotating machinery comprising:

vibration detector means for detecting vibrations caused by the rotating machinery and generating electrical signals indicative of the detected vibrations;

bandpass filter means through which said electrical signals are passed;

analog-to-digital converter means for converting said electrical signals into digital signals;

digital frequency spectrum analyzing means for calculating a frequency spectrum distribution from said digital signals;

discriminator means for selecting high amplitude values from said frequency spectrum distribution;

amplitude detector means for processing spectrum distribu-

tion data of frequencies within a range of that of said high amplitude value to select the maximum amplitude and the frequency at which it occurs; and

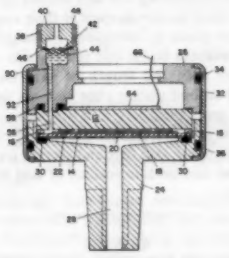
recorder means for recording an output from said amplitude detector means.

4,425,799

LIQUID CAPACITANCE PRESSURE TRANSDUCER TECHNIQUE

Kyong M. Park, Chatsworth, Calif., assignor to Kavlico Corporation, Chatsworth, Calif.

Filed Jun. 3, 1982, Ser. No. 384,510
Int. Cl.³ G01L *9/12*; H01G *7/00*
U.S. Cl. 73—718 **11 Claims**



1. A capacitive sensor for measuring differential pressure between a first and a second liquid comprising:

first and second flat insulating plates, at least one of said plates being a diaphragm;

means for mounting said plates spaced apart from one another and sealed to one-another along a narrow zone spaced out from the center of said plates for facilitating free movement of said plates toward and away from one-another as the pressure across the diaphragm varies, the spacing between said plates being in the order of 0.5 to 20 thousandths of an inch,

means including conductive coatings on the inner surfaces of the facing opposed portions of said plates for forming a variable capacitor located toward the center of said plates which changes substantially with changes in differential pressure, and a reference capacitor located outward from the center of said plates near said narrow zone, said reference capacitor only charging slightly with changes in capacitance;

means for coupling and directing said first liquid to the outside of said diaphragm;

a conduit containing a thin membrane or bellows; and

a low viscosity dielectric fluid completely filling the space between said plates and said conductive coatings and filling said conduit up to and engaging said membrane or bellows;

means for conducting and directing said second liquid to the other side of said bellows,

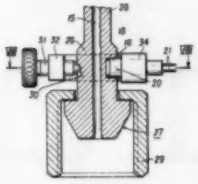
whereby the changes in capacitance of said sensor directly indicate the pressure differential between said first and second liquid.

4,425,800

MEANS FOR ASCERTAINING THE INTERNAL PRESSURE IN A PRESSURE PIPE SYSTEM

Peter Claassen, and Rudolf Zeiringer, both of Graz, Austria, assignors to Hans List, Graz, Austria

Continuation of Ser. No. 178,587, Aug. 15, 1980, abandoned, which is a continuation of Ser. No. 17,121, Mar. 5, 1979, abandoned, which is a continuation of Ser. No. 793,365, May 3, 1977, abandoned. This application Jun. 9, 1981, Ser. No. 272,007
Claims priority, application Austria, May 7, 1976, 3348/76; May 21, 1976, 3757/76
Int. Cl.³ G01L *7/08, 9/00*
U.S. Cl. 73—730 **6 Claims**



1. A means for ascertaining the internal pressure in an injection pump system which comprises

a solid, one piece connector nipple which is interconnectable with the injection pump system, said connector nipple including a generally cylindrically-shaped portion which defines an outer surface and includes an axial passageway extending therethrough, said generally cylindrically-shaped portion also including at least one blind bore extending inwardly from said outer surface toward said axial passageway, the bottom of each said blind bore being smooth and defining a wall portion of said connector nipple which is sufficiently thin that it is elastically deformable when subjected to the pressure of a pressure fluid in said axial passageway,

a holding device, and

a load sensor cell mounted on said holding device, said load sensor cell being shaped to fit within each said blind bore such that, when solely and temporarily pressed into direct contact with the smooth bottom of a particular blind bore by means of said holding device, it will measure the elastic deformity in the associated wall portion of said connector nipple and thus provide information as to the internal pressure in said axial passageway and consequently in the injection pump system.

4,425,801

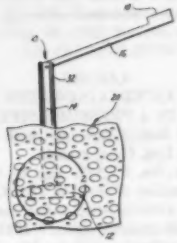
DEVICE AND PROCEDURE FOR MEASURING IN SITU STRENGTH OF CONCRETE AND THE LIKE

Ulrich W. Stoll, 2121 Hall, Ann Arbor, Mich. 48104

Filed Jan. 4, 1982, Ser. No. 336,669
Int. Cl.³ G01N *3/00*
U.S. Cl. 73—803 **11 Claims**

1. A device for measuring the strength of brittle material such as concrete comprising a body member embedded in said brittle material, said body member comprising a substantially disklike member configured to form at least one generally

radially outwardly extending surface forming a reacting surface on said body member operable to exert a compressive



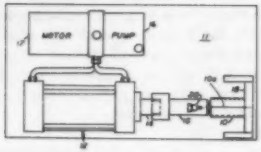
force on said brittle material in response to a measurable torque applied to said body member.

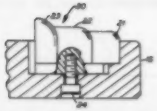
4,425,802

APPARATUS AND METHOD FOR TESTING TUBE WELDS

Harold P. Sponseller, Toledo, Ohio, assignor to Harold Sponseller and Associates, Inc., Toledo, Ohio

Filed May 20, 1982, Ser. No. 380,224
Int. Cl.³ G01N 3/08
U.S. Cl. 73—827 12 Claims





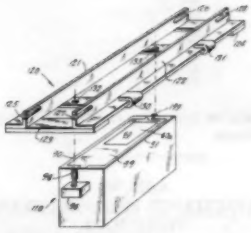
1. A device for testing joints in a rigid tubular material comprising a first fixture means for supporting a fixed first end of said tubular material, second fixture means contacting a non-fixed second end of said material, said second fixture means having a movable mandrel member and a lineal series of progressively-larger rigid bulbous portions adjacent the extremity of said mandrel member adapted to engage the seam area of said material and means for progressively loading the said second fixture means with increasing axial force to determine the breaking strength of said seam area by the increased stepwise radial loading thereof by the rigid bulbous portions.

4,425,803

TRANSDUCER STRUCTURE AND MOUNTING ARRANGEMENT FOR TRANSDUCER STRUCTURE FOR CLAMP-ON ULTRASONIC FLOWMETERS

Joseph Baumoel, 107 Columbia Dr., Jericho, Long Island, N.Y. 11753

Division of Ser. No. 146,530, May 5, 1980, Pat. No. 4,373,401. This application Aug. 19, 1982, Ser. No. 409,564
Int. Cl.³ G01F 1/66
U.S. Cl. 73—861.18 7 Claims



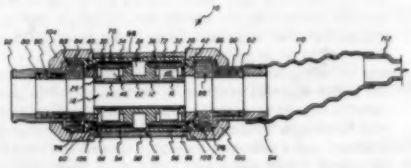
1. Mounting means for mounting a transducer on a pipe; said transducer comprising a rectangular body having first and second mounting lugs on its opposite ends and a sonically active bottom surface for engagement with said pipe; said mounting means comprising first and second parallel elongated track members fixed to one another at their opposite ends and defining between them an elongated rectangular opening receiving said transducer body; said rectangular opening having a length greater than the length of said transducer body; spaced first and second sliding clips slidably mounted on said first and second track members; said first and second mounting lugs connected to said first and second sliding clips; and clamping means for clamping said first and second track members to said pipe to press said bottom surface of said transducer body against said pipe.

4,425,804

ULTRASONIC AIR FLOW TRANSDUCER FOR HIGH HUMIDITY ENVIRONMENTS

Bruce E. Mount, Diamond Bar, and Con D. Rader, Villa Park, both of Calif., assignors to The Perkin-Elmer Corp., Norwalk, Conn.

Filed Oct. 29, 1981, Ser. No. 316,177
Int. Cl.³ G01F 1/66
U.S. Cl. 73—861.28 13 Claims



1. In a transducer assembly for measuring the volume flow rate of gaseous fluids along a path and useable particularly in high humidity environments and which includes an inner transducer having means defining a substantially cylindrical cavity and a pair of substantially cylindrical signal transducers disposed along said cavity and responsive to alternately produced signals applied to each of the pair of signal transducers to produce acoustic compressions in the fluid during the transmit signal from one signal transducer and to produce received signals responsive to said acoustic compression in the other signal transducer which signals are proportional to the veloc-

ity of the acoustic compressions traveling from the first to the second signal transducer, the improvement comprising,

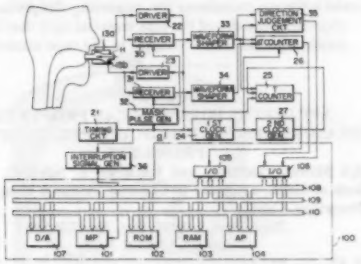
means for heating the inner transducer to maintain the fluid in said cavity at a temperature higher than ambient temperature to maintain the fluid in the cavity below saturation point to prevent moisture from forming in said cavity.

4,425,805

RESPIRATION FLOWMETER

Ichiro Ogura, and Ayao Itoh, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 29, 1981, Ser. No. 316,286
Claims priority, application Japan, Oct. 31, 1980, 55-153261
Int. Cl.³ G01F *1/66*; A61B *5/08*
U.S. Cl. 73—861.29 **7 Claims**



1. A respiration flowmeter comprising:

a conduit through which expiration and inspiration flow;

a pair of recesses formed on an inner wall of the conduit along a line slanted with respect to a flow direction of the respiration gas;

a pair of ultrasonic transducers provided in said recesses with their ultrasonic transmitting and receiving surfaces oppositely faced each other along said line;

means simultaneously switching said ultrasonic transducers between a drive mode and a receiving mode;

digital counting means for measuring either of the two propagating times taken for ultrasonic wave radiated from one of said pair of driven transducers to reach the other transducer and a difference between said two propagating times;

means for judging the flow direction of said respiration gas;

means for generating a signal for requesting calculation of a flow velocity of the respiration gas every time said pair of transducers are driven;

means for storing said flow direction, said two propagation times and said propagation time difference in response to said calculation request signal; and

means for calculating and storing a flow rate of said respiration gas on the basis of said stored values.

4,425,806

MODULAR ORIFICE METER WITH ISOLATION CHAMBER VALVE CLOSURE

Davis A. Van Scoy, Simonton, Tex., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Mar. 29, 1982, Ser. No. 362,883
Int. Cl.³ G01F *1/42*
U.S. Cl. 73—861.61 **4 Claims**

1. An orifice meter comprising:

a main housing;

a service housing open at top and bottom secured to said main housing so that the open bottom thereof is in communication with said main housing;

a carrier for an orifice disc mounted in said housing for linear sliding movement therebetween;

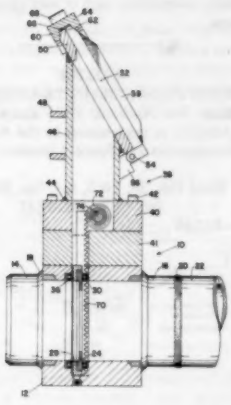
aligned flow tubes on said main housing;

means for sealing between said main housing and said disc carrier around said flow tubes;

a rack mounted on said carrier to extend in the direction of carrier movement;

a pinion rotatable in one of said housings engaging said rack;

selectively operated means for rotating said pinion;



the upper open end of said service housing being dispsed at an acute angle to the plane of carrier movement to enable frontal placement and removal of orifice discs when said carrier is in an elevated position within said service housing;

a seal plate secured and sealed to said service housing around said upper open end;

a closure pivoted to said service housing for movement toward and away from said seal plate; and

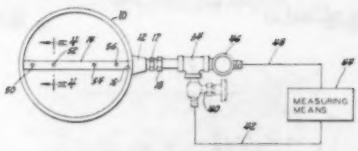
means operative to lock said closure in face to face engagement with said seal plate.

4,425,807

FLOW MEASURING DEVICE WITH CONSTANT FLOW COEFFICIENT

Michael Victor, 28761 Maplewood, Garden City, Mich. 48135

Filed Feb. 11, 1982, Ser. No. 347,957
Int. Cl.³ G01F *1/46*
U.S. Cl. 73—861.65 **9 Claims**



1. A flow-sensing tube means supported transversely to fluid flowing in a conduit for measuring differential flow pressure, comprising:

a hollow, elongated tubular member having a circular exterior cross section;

wall means in said tubular member forming a first chamber and a second chamber;

first flow-sensing opening means through the wall of said tubular member facing in a first radial direction and fluidly connected to the first chamber;

second flow-sensing opening means through the wall of the

tubular member facing a second radial direction and fluidly connected to the second chamber, the second opening means being formed on a radial axis forming an angle greater than 105 degrees but less than 115 degrees with respect to a radial axis passing through the first opening means;

means for mounting the tubular member in the conduit in the path of fluid flow with the first opening means facing the flow of fluid; and

means fluidly connecting each of said chambers to a measuring means.

4,425,808

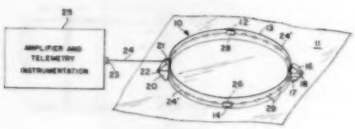
THIN FILM STRAIN TRANSDUCER

James L. Rand, San Antonio, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 26, 1982, Ser. No. 352,827

Int. Cl.³ G01L *1/22*

U.S. Cl. 73—862.65 **9 Claims**



1. A strain transducer system comprising:

a ring shaped metal strip;

a plurality of strain gages secured to said metal strip in a Wheatstone bridge configuration;

means for attaching said ring shaped metal strip to the continuous surface of an inflatable member upon which strain is to be measured; and

means for measuring changes in the ring shaped metal strip as a function of strain on the attached continuous surface.

4,425,809

MEASURING OF TENSION AND MOMENTS IN A THIN FLEXIBLE TAPE

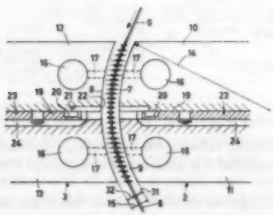
Bernardus L. M. van Bakel; Guillaume P. C. van Kooijk, and Bernard P. Videc, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,839

Claims priority, application Netherlands, Dec. 11, 1980, 8006719

Int. Cl.³ G01L *5/08*

U.S. Cl. 73—862.45 **10 Claims**



1. A device for measuring stresses in a thin flexible tape material, comprising:

at least one pair of guide elements, spaced from each other and having guide surfaces on adjacent sides, which guide surfaces extend substantially parallel to each other and between which surfaces a guide channel is formed for the tape material,

supply ducts terminating in said guide surfaces, for supplying to both sides of a tape in the guide channel a pressurized gaseous medium by which the tape can be guided longitudinally in the guide channel along a path substantially parallel to and spaced from said guide surfaces,

at least one respective measuring duct having a respective measuring duct termination in each guide surface arranged at least substantially directly opposite a measuring duct termination in the other guide surface, forming therewith a pair of measuring-duct terminations, and

at least one pressure transducer communicating with the measuring ducts,

characterized in that the guide surfaces have correspondingly curved shapes arranged such that the tape material is guided in the guided channel along a curved path, and

the device further comprises measuring means, connected to the pressure transducer for measuring the pressure difference on both sides of the tape material such that the device measures local tensile stresses in the tape material.

4,425,810

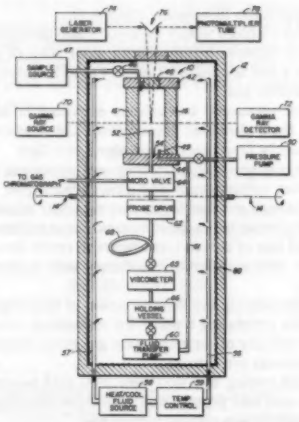
APPARATUS FOR PHYSICAL PROPERTIES MEASUREMENTS AT HIGH TEMPERATURES AND PRESSURES

Ralph Simon, Placentia, and Raymond L. Schmidt, Whittier, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 5, 1981, Ser. No. 318,506

Int. Cl.³ G01N *1/28*

U.S. Cl. 73—863.11 **24 Claims**



1. Apparatus for measuring physical and chemical properties of fluid and/or solid systems including composition, density, viscosity and interfacial tension of a sample, said measurements being conducted at controllable temperature and pressure, said apparatus comprising:

(a) a sample cell and means for inserting a sample into said sample cell, said sample cell being capable of maintaining said sample at said controllable temperature and pressure;

(b) means movable within said sample cell and means for moving said movable means to determinable positions within said sample cell;

(c) means connected to said movable means for capturing a measured quantity of said sample and for maintaining said measured quantity at the temperature and pressure maintained within said sample cell;

(d) means for moving said captured sample to means for measuring properties of said sample and for returning said

captured sample to said sample cell without changing the temperature and pressure on said captured sample;

(e) and means for making visual and/or electromagnetic energy observations from outside said sample cell on said sample contained within said sample cell.

4,425,811

CRYOGENIC PUMP AND AIR SAMPLER

Johann Chatzipetros, Frechen, and Manfred Helten, Titz-Muntz, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

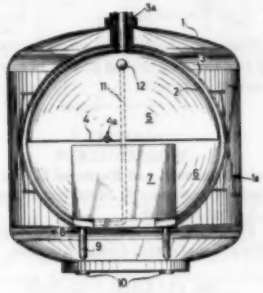
Continuation of Ser. No. 198,042, Oct. 17, 1980, Pat. No. 4,337,669. This application Jun. 18, 1982, Ser. No. 390,123

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942305

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.³ G01N *1/14*

U.S. Cl. 73—863.11 **12 Claims**



1. A cryostat comprising:

an evacuated vessel;

a reservoir for a cryogenic liquid coolant mounted in said vessel and having an upright normal position;

a membrane partitioning said reservoir into an upper first component and a lower second compartment in said position;

a cryogenic adsorber in said second compartment and communication with said vessel for maintaining a vacuum therein;

at least one cold surface disposed below said adsorber in said position;

means for cooling said surface and including at least one tube traversing said membrane and opening into said first compartment; and

a respective orifice formed on said vessel and selectively blockable and unblockable for passing material to be cooled to said cooled surface.

4,425,812

ENGINE STARTER DRIVE DEVICE

James O. Williams, Horseheads, N.Y., assignor to Facet Enterprises, Incorporated, Tulsa, Okla.

Filed Apr. 2, 1981, Ser. No. 250,508

Int. Cl.³ F02N *15/06*; F16D *43/06*

U.S. Cl. 74—6 **19 Claims**

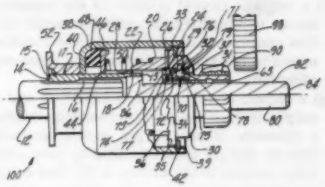
1. An engine starter drive device for mounting on a power shaft of a motor and for starting an engine having a starter gear, said starter drive device comprising:

a sleeve member slidably mounted on said power shaft for rotation therewith, said sleeve having one end portion and another end portion opposite said one end portion, said sleeve member further having external helical splines formed on said one end portion and an outer diameter extending from said external helical splines to said another end portion;

a mounting shaft coaxially mounted adjacent to said power shaft, said mounting shaft having a first end, a second end opposite said first end and a first outer diameter adjacent to said first end, said second end connected to said one end portion of said sleeve member for movement therewith;

a pinion gear mounted on said first outer diameter of said mounting shaft for relative rotation therewith, said pinion gear further moving axially into and out of engagement with said starter gear;

a driving clutch member coaxially disposed with said mounting shaft, said driving clutch member having one end and an opposite end, said one end having first axially extending dentil clutch teeth, said opposite end being slidably mounted on said external helical splines of said sleeve member;



an annular driven clutch member interposed said pinion gear and said driving clutch member, said annular driven clutch member having a first end secured to said pinion gear and a second end opposite said first end, said second end having second axially extending dentil clutch teeth to engage said first axially extending dentil clutch teeth on said driving member, said first and second axially extending dentil clutch teeth having inclined complementary mutually engageable inclined teeth for transmitting torque between said driving and driven clutch members in one direction of rotation; and

means, interposed said driving and driven clutch members, for axially separating said driving clutch member away from said driven clutch member when said driven clutch member rotates above a predetermined rotational speed.

4,425,813

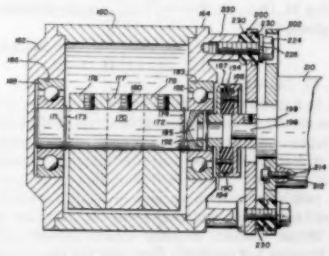
VIBRATION DAMPENING APPARATUS FOR MOTOR ACTUATED ECCENTRIC FORCES

Theodore S. Wadensten, P.O. Box 8 Stilson Rd., Wyoming, R.I. 02898

Filed Jun. 4, 1981, Ser. No. 270,647

Int. Cl.³ F16H *33/10*; B06B *1/16*; F16D *3/68*

U.S. Cl. 74—87 **12 Claims**



1. A vibration dampening apparatus for rotating at least one eccentric weight carried on and by a shaft isolated from trans-

mitting said vibrations to a motor rotating said shaft, the dampening apparatus including:

(a) an independent housing within a cavity of which at least one eccentric weight is moved and rotated;

(b) a support shaft rotatably carried within and by said independent housing;

(c) at least one eccentric weight secured to said shaft and rotated as the support shaft is rotated;

(d) at least one bearing means carrying said shaft and mountable in an end portion of the housing means, said housing means sized so as to accommodate the forces of vibration from the eccentric weight to said shaft as the shaft is rotated;

(e) a first coupling half mounted and secured to one end of said support shaft and having a plurality of spaced pin means secured thereto and therein, said pin means protruding from a surface substantially normal to the axis of said shaft, said pin means extending in a direction away from said eccentric weight;

(f) a resilient central portion of the coupling and having means to slidably retain said pin means provided in the first coupling half, and in mounted condition on the pin means to be arranged substantially adjacent the first coupling half;

(g) a second coupling half mounted on and secured to an output shaft of a motor, said second coupling half having a plurality of spaced pin means secured thereto and therein, said pin means protruding from a surface substantially parallel to the surface in the first coupling half, said pin means extending in a direction towards said first coupling half and disposed to enter additional means provided in said resilient central portion, the pin means in the first and second coupling halves intermeshed in retaining means in the central portion so as to transmit the torque from the motor to said coupling halves with the resilient central portion isolating the vibrations from the rotation of the eccentric weight and preventing transmittal of said vibrations to the motor shaft;

(h) said motor positioned adjacent to said independent housing and with vibrations from the rotation of the eccentric weight through and from the independent housing to a housing of the motor being isolated and dampened by a first plurality of resilient washer means carried in and by an isolation disk and said housing is secured through said first resilient washer means to the independent housing by securing means and with this isolation disk further isolated and dampened by another and second multiplicity of resilient washer means carried by a motor mount disk and with said motor mount disk secured to the isolation disk through said second resilient washer means by securing means, and

(i) means for securing a frame of said motor to the motor mount disk.

4,425,814

TORQUE LIMITING DEVICE

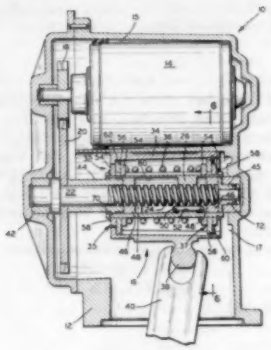
Wesley M. Dick, Ft. Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 23, 1981, Ser. No. 246,536

Int. Cl.³ F16H *25/20*

U.S. Cl. 74—89.15 **10 Claims**

1. In a speed change mechanism actuable by a travelling nut on an axially extending rotatable screw shaft within a housing; an improvement comprising torque limiting means for reduction of impact loads on said shaft created by stoppage of said nut at each end of said shaft including (1) at least one friction disc rotatable relative to said housing, rotatably fixed, with respect to said nut, and axially slidable over said nut, (2) at least one torque reaction member axially slidable with respect to said housing but rotatably fixed relative thereto, and (3) means for urging said friction disc against said torque reaction member wherein said torque limiting means comprises a first group of two friction discs and an associated torque reaction member interjacent said discs, said first group being at one end of said shaft, said torque limiting means further comprising a second group of friction discs and an associated torque reaction member at the other end, wherein said spring is positioned axially intermediate said first and second groups of associated friction discs and reaction members.



4,425,815

WORMWHEELS

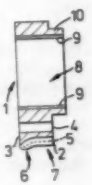
Colin F. Norton, Andover, and Raymond G. Harvey, Newbury, both of England, assignors to Mastergear Company Limited, Newbury, United Kingdom

Filed Oct. 10, 1980, Ser. No. 196,022

Claims priority, application United Kingdom, Aug. 29, 1980, 8028068

Int. Cl.³ G01H *1/00, 9/10*

U.S. Cl. 74—425 **7 Claims**



1. A worm and wormwheel, the wormwheel being of moulded sintered metal and having teeth disposed about at least a portion of its periphery, the pitch diameter of the teeth being greater adjacent one transverse face of the wheel than at the other face of the wheel, the pitch diameter of each tooth never increasing along the path of the tooth from said one face to the other face and each tooth having a straight portion with no helical angle, and the worm being of a harder material than the wormwheel so that in use the straight portions of the teeth of the wormwheel will wear to increase the contact between the teeth of the worm and wormwheel.

4,425,816

STRUCTURE FOR SECURING A CYLINDER DRIVE GEAR TO THE END OF A CYLINDER SHAFT IN A PRINTING MACHINE

Hideaki Toyoda, Tokyo, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

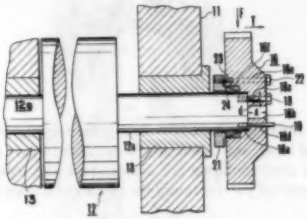
Filed Jan. 5, 1981, Ser. No. 222,669

Int. Cl.³ F16H *55/12*

U.S. Cl. 74—439 **4 Claims**

1. In a printing press, a plate cylinder, a supporting frame

comprising spaced, supporting frame members, bearing members supported on the frame in alignment, shafts at the opposite ends of the plate cylinder rotatably journaled in said bearings, one at least of said shafts at one end extending through its bearing such that its end is outboard of the frame at that side, a drive gear having an integral hub portion of greater thickness than the width of the drive gear, said hub portion containing in the side facing the frame member a cylindrical recess extending partway through, said cylindrical recess corresponding in inside diameter to the outside diameter of the shaft and means for securing the drive gear to the outboard end of the shaft comprising, in combination, telescoping concentric inner and outer rings of opposite triangular cross section positioned within said cylindrical recess about the shaft, the outer ring having an outer cylindrical surface in contact with the inner surface of the cylinder recess and the inner ring having an



inner cylindrical surface in contact with the exterior surface of the shaft and said rings having an axial thickness slightly less than the depth of the recess, a clamp ring having an outside diameter larger than the diameter of the shaft positioned about the shaft between the gear and the frame member, said clamp ring having an annular shoulder protruding from the side facing the gear of such radial width as to have contact exclusively with the inner one of the telescoping rings and radially outward thereof a plurality of peripherally-spaced threaded holes and said hub of the gear containing corresponding peripherally-spaced holes and bolts in the holes in the hub of the gear threaded into holes in the clamp ring holding the protrusion thereon in clamping engagement with the inner one of the telescoping rings such as to expand the outer one of the telescoping rings against the inner surface of the recess and to contract the inner one of the telescoping rings against the surface of the shaft.

4,425,817

LUBRICATION SYSTEM FOR A POWER TAKE OFF ASSEMBLY AND A DRIVE SHAFT THEREFOR

Calvin G. Wells, Warren, and Joseph L. Malkowski, Troy, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 16, 1981, Ser. No. 244,178
Int. Cl.³ F16H *57/04, 37/00*
U.S. Cl. 74—467 **2 Claims**

1. A lubrication system for a power take off assembly and a drive shaft therefore; said drive shaft being mounted for rotation within a housing and having an end thereof aligned with an opening in said housing; said drive shaft having a central bore open at said end and including radial passages extending from said central bore to be capable of providing lubricating oil to a plurality of elements mounted on said drive shaft; said housing having a supply of lubricating oil in a sump thereof; said powr take off assembly including a casing sealingly secured about said opening in said housing, a take off shaft coaxially aligned with said drive shaft and mounted on bearings for rotation within said casing, and means for selectively coupling said take off shaft to said drive shaft for rotation therewith; said lubrication system comprising:

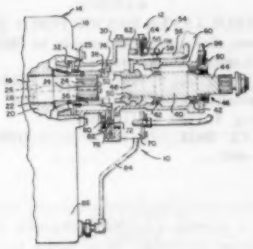
a tubular sleeve secured to said end of said shaft and having a first end adjacent said take off shaft and a second end remote therefrom;

said means for selectively coupling including a plurality of fixed, axially extending dog teeth on said first end of said tubular sleeve;

said tubular sleeve having a plurality of radially extending teeth about a cylindrical extending region of said first end thereof to provide a driving gear;

an oil pump mounted on said casing and having a pump shaft extending into said casing;

a driven gear fixedly secured to said pump shaft within said casing and engaging said driving gear for rotation in response to rotation of said drive shaft;



lubricating oil supply piping from said sump to said pump;

lubricating oil discharge piping from said pump to an end of said casing remote from said housing;

means for sealing said casing to allow said lubricating oil to be delivered by said pump to said bearings, said means for selectively coupling and said central bore of said drive shaft through said end thereof during rotation of said drive shaft; and

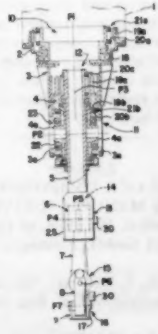
said means for sealing including a circumferential seal between said housing and a cylindrical extending surface of said second end of said tubular sleeve to insure said lubricating oil will only be returned to said housing and said sump thereof through said central bore of said drive shaft.

4,425,818

ROBOTIC MANIPULATOR

Haruhiko Asada, and Takeo Kanade, both of Pittsburgh, Pa., assignors to Carnegie-Mellon University, Pittsburgh, Pa.

Filed Sep. 30, 1981, Ser. No. 307,090
Int. Cl.³ B23Q *3/18*
U.S. Cl. 74—469 **4 Claims**



1. Means for joining a first segment of a manipulator arm with a second segment connected at one end with manipulating means in a composite joint allowing rotation of the second

segment about an axis at an angle to the longitudinal axis of the first segment and providing pivotal movement of the second segment about the common longitudinal axis of the segments comprising a fork fixed to an end of the first segment, a pin rotatably mounted in said fork, means pivotally mounting the second segment in the pin normal thereto so that both ends of the second segment extend therefrom, a rotor or stator coaxially affixed to the end of the second segment opposite the manipulator means end and a stator or rotor coaxial with its mating rotor or stator at the end of the second segment affixed to said pin, whereby the weight of said rotor and stator tend to counter-balance the weight of the manipulator means of the second segment.

4,425,819

CONTROL LEVER DEVICE FOR A BICYCLE

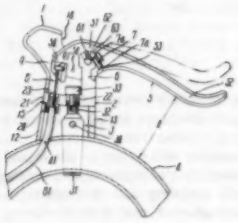
Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 9, 1981, Ser. No. 272,047

Claims priority, application Japan, Jun. 25, 1980, 55-89767[U]; Aug. 8, 1980, 55-112888[U]

Int. Cl.[1] **B62L** *3/02*; **B62K** *23/06*; **G05G** *5/04*

U.S. Cl. 74—489 **8 Claims**



1. A control lever device mounted on a handle bar of a bicycle and comprising:

a bracket member having a fixing means for fixing said bracket member to said handle bar, said bracket member having a front wall, side walls and a rear wall, being formed in a box-like shape having an opening at a rear side thereof, and having a rising member extending toward said opening;

a control lever mounted pivotally on the top of said rising member and having a boss and a grip portion, said boss being inserted at its utmost end into said bracket member through said opening, and having at said utmost end a retainer for a control wire, said grip portion being opposite to said handle bar; and

an adjuster mounted on said rising member for adjusting a distance between said grip portion and said handle bar, said adjuster having a contact portion which contacts with said control lever and a control portion for moving said adjuster, said contact portion contacting with said control lever to restrict the distance between said grip portion and said handle bar.

4,425,820

CONNECTING ROD OF A COMPOSITE MATERIAL AND METHOD FOR MANUFACTURING THE SAME

Adolf Swozil, Kühlenthal, Fed. Rep. of Germany, assignor to Sigri Elektrographit GmbH, Meitingen bei Augsburg, Fed. Rep. of Germany

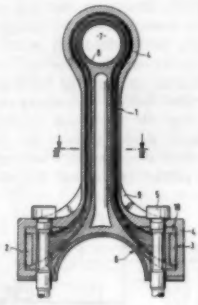
Filed Feb. 3, 1981, Ser. No. 231,008

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004575

Int. Cl.[3] **G05G** *1/00*

U.S. Cl. 74—579 R **5 Claims**

1. Connecting rod of composite material formed from reinforcement fiber wound in the form of an endless loop with constant cross-sectional area and varying cross-sectional shape, said endless loop of reinforcement fibers enclosed by a jacket of aluminum, said connecting rod comprising a connecting rod eye, a connecting rod shank and an arc curved part of a connecting rod head in the form of a double loop of reinforcement fibers which has cutouts in the vicinity of the connecting rod head, and wherein said arc curved part is adapted to match a corresponding arc curved part and form a circle with both curved parts forming the circle connected by expansion bolts.



4,425,821

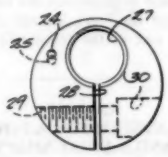
ENGINE BALANCER

Floyd G. West, Crete, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 10, 1980, Ser. No. 214,641

Int. Cl.[3] **F02B** *75/06*; **F16C** *3/04*

U.S. Cl. 74—604 **10 Claims**



1. An engine balancer on a four cylinder in line engine comprising, a crankshaft rotatably mounted on its axis of rotation, a plurality of main bearings rotatably supporting the crankshaft, an engine balancer mounted underneath said crankshaft including pairs of counterweights eccentrically mounted on counterweight shafts on axes of rotation parallel to the crankshaft axis, a crankshaft drive gear drivingly connected to said crankshaft for driving counterweight gears, a housing supporting said counterweight gears and counterweight shafts, one of said counterweights mounted on each of said counterweight shafts, means defining an eccentric shaft opening for receiving the counterweight shafts for driving said counterweights, a slot extending axially the length of said counterweight, a fastening means for adjustably clamping said counterweight on each of said counterweight shafts, alignment means including aligning holes on said counterweight gears, said housing and said counterweights for providing alignment adapted for receiving a pin to provide alignment of components.

4,425,822
HARMONIC-DRIVE ASSEMBLY

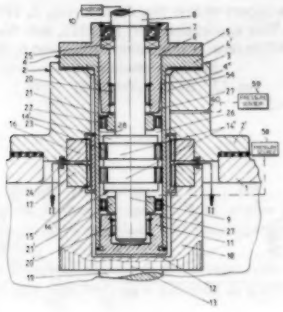
Heinz Marschner, Kressbronn; Fritz Heinemann, Friedrichshafen, and George Marsland, Kressbronn, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 31, 1980, Ser. No. 202,747

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944123; Nov. 2, 1979, 2944124

Int. Cl.³ F16H *33/00, 1/28*

U.S. Cl. 74—640 18 Claims



1. A motion-transmitting device of the harmonic-drive type, comprising:

a housing;

a cup-shaped member with a flexible cylindrical wall disposed in said housing and provided on an outer surface with a multiplicity of elongate gear teeth extending parallel to an axis of symmetry of said wall, said member being rigidly attached at an open end to said housing;

a shiftable component slidably and rotatably attached to said housing at a side thereof opposite the open end of said member, said component forming a motion-output element of said device;

stressing means including a rotatable mechanical wave generator in said member for contacting an inner surface of said cylindrical wall and deforming same to assume an elliptical cross-section along a portion of the height of said wall;

drive means operatively connected to said stressing means for rotating said wave generator and thereby a major axis of said elliptical cross-section;

an inwardly toothed first ring gear rigid with said housing and encircling said member, said gear having teeth equal in number to said elongate gear teeth and meshing therewith only at substantially opposite sides of said member;

an inwardly toothed second ring gear rigid with said component and longitudinally spaced from said first ring gear, said second ring gear having teeth greater in number than said elongate gear teeth and meshing therewith only at substantially opposite sides of said member;

insulating means for sealing said housing; and

reinforcing means in said member at least at the open end thereof for bracing said wall against deformation at points spaced from said wave generator.

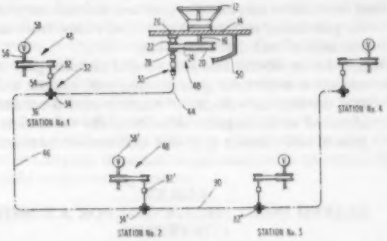
4,425,823
MECHANISM FOR CONTROLLING REMOTELY DISPOSED INDUSTRIAL VALVES AND THE LIKE

Walter Kulischenko, East Brunswick, N.J., and Martin J. Capdevielle, Staten Island, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 28, 1981, Ser. No. 297,394

Int. Cl.³ F16H *37/06;* F16C *1/10;* F16K *31/00*

U.S. Cl. 74—665 GE 14 Claims



1. Apparatus for imparting rotary motion to each of a plurality of remotely disposed devices comprising a plurality of remotely disposed valve stems capable of being rotated in either direction to open and close valves associated therewith, said apparatus comprising

a handwheel remotely disposed from said devices,

a first flexible shaft responsive to rotation of said handwheel and adapted to transmit torque therefrom to first of said plurality of devices,

an additional flexible shaft connected between succeeding devices to thereby serially connect said first of said plurality of devices to last of said devices, each of said additional flexible shafts transmitting torque to a succeeding device from an immediate upstream device, and

means cooperating with each of said flexible shafts for controlling said transmitted torque whereby rotation of said handwheel in one direction rotates each of said remotely disposed devices in same direction.

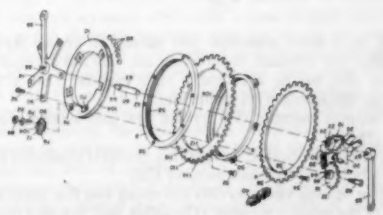
4,425,824
VARIABLE TORQUE BICYCLE SPROCKET

Curtis J. Koch, 1142 Scott, Waterloo, Iowa 50701

Filed Jul. 10, 1981, Ser. No. 282,113

Int. Cl.³ F16H *3/44;* G05G *1/14*

U.S. Cl. 74—750 B 5 Claims



1. Apparatus for driving a foot-propelled vehicle comprising

a pair of non-circular gears interactively connected

one of said non-circular gears affixed to the frame of the vehicle to be propelled

the second of said non-circular gears being rotatively coupled to a circular gear,

the circular gear having teeth thereon,

a pinion enclosure having pinion teeth therein enclosed,

said teeth of said circular gear engaging the pinion teeth of said pinion enclosure,

said second non-circular gear and said circular gear mounted to a first axle,

said pinion enclosure being fixed to drive sprocket having central axle journalled therethrough,

said first non-circular gear having opening centrally therein,

said central axle passing through said opening in said first non-circular gear,

said axle of said drive sprocket having a crank arm fixed to each end thereof, in diametrically opposing relationships,

said first axle of said circular gear and said second non-circular gear being maintained at a fixed radius from said central axle of said drive sprocket,

means for revolving said axle of said circular gear and said second non-circular gear around said central axle such that the angular velocity of rotation of said central axle is identical to the angular velocity of the revolution of said axle of said circular gear and said non-circular gear.

4,425,825

GEARED INPUT MECHANISM FOR A TORQUE CONVERTER

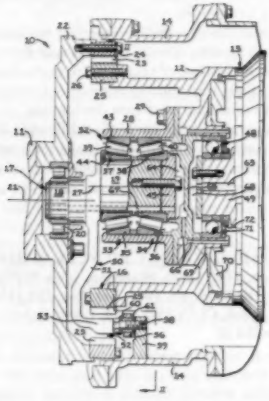
Robert O. Chambers, Peoria, and Marion E. Ogden, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00550, § 371 Date May 12, 1980, § 102(e) Date May 12, 1980, PCT Pub. No. WO81/03365, PCT Pub. Date Nov. 26, 1981

PCT Filed May 12, 1980, Ser. No. 262,961

Int. Cl.³ F16H 1/28

U.S. Cl. 74—804 **18 Claims**



14. In a drive apparatus (**10**) having an engine flywheel member (**22**) rotatable about a first axis (**21**) and a torque converter (**13**) having a rotatable input member (**12**), a speed change mechanism (**16**) comprising:

a support member (**17**) having first and second portions (**18**,**19**);

an internally toothed driving ring gear (**23**) connected coaxially to said flywheel member (**22**);

a first bearing assembly (**20**) journaling said first portion (**18**) of the support member (**17**) within said flywheel member (**22**) coaxially of said first axis (**21**);

retaining means (**50**) for preventing rotation of said support member (**17**) about said first axis (**21**) while allowing limited axial and radial play movement thereof;

a second bearing assembly (**32**) on said second portion (**19**) of the support member (**17**) defining a second axis (**27**) spaced generally parallel to said first axis (**21**); and

an externally toothed driven ring gear (**25**) rotatably carried by said second bearing assembly (**32**) and meshed with said driving ring gear (**23**), said driven ring gear (**25**) being drivingly connected to said converter input member (**12**).

4,425,826

TOOL FOR REMOVING LIDS FROM TINS

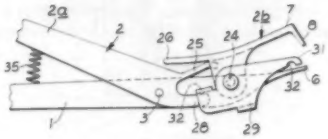
Albert E. Morris, 64 Kuroki St., Penshurst, New South Wales 2222, Australia

Continuation-in-part of Ser. No. 63,322, Aug. 2, 1979, Pat. No. 4,327,607. This application Apr. 10, 1981, Ser. No. 253,113

The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.

Int. Cl.³ B67B 7/00; B25F 1/00

U.S. Cl. 81—3.36 **3 Claims**



1. A gripping tool for removing from a tin a lid having an annular peripheral lip projecting from an upstanding flange, the gripping tool comprising first and second members pivotally interconnected and having respective jaw elements at one end and characterized by the first member having its jaw element shaped and dimensioned for insertion under the lip of the lid and tapering to a flat tip of screw-driver-like form; and the second member having its jaw element being generally L-shaped and comprising a first part and a second terminal part, the first part being shaped and dimensioned for extending over the lip of the lid and the second terminal part being formed and dimensioned to extend down along and in contact with the flange of the lid and beyond the extreme end of said screwdriver tip for gripping the lid when the tool is closed; the spacing of the tip of the jaw element of the first member and the opposite face of the second terminal part of the second member decreasing steadily during closure so that, when said tool is in a closed position, the tip of the jaw element of the first member co-operates with the second terminal part of the second member to trap therebetween said upstanding lid flange whereby removal pressure may be exerted on said lid without distortion of said annular peripheral lip;

said second member comprising separate handle and beak portions pivotally mounted on a common pivot with said first member;

the tool further comprising a third member pivotally mounted on said common pivot, having at least one forward projecting prong lying adjacent said screwdriver tip, and being provided with an abutment;

an arm being comprised in said handle portion and being disposed and dimensioned for contacting said abutment and rotate said third member;

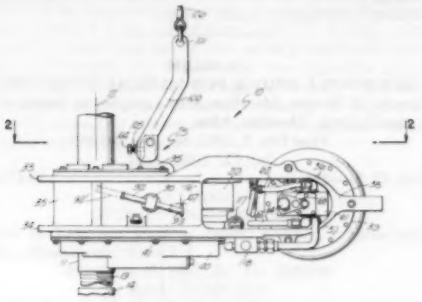
the tool being operative so that as said first member and said handle are squeezed together, in a first phase of closure said upstanding flange is trapped as aforesaid, and in a second phase of closure said arm contacts said abutments so as to rotate said third member exerting force on the rim of the tin and removing the lid from the tin.

4,425,827

SUSPENSION OF PIPE SPINNER

Lawrence E. Wells, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed Feb. 23, 1982, Ser. No. 351,462
Int. Cl.[3] B25B *13/50*
U.S. Cl. 81—57.19 19 Claims



1. A pipe spinner comprising:

a plurality of rollers engageable with a pipe at different locations about its periphery and adapted to grip and spin the pipe;

two body members having portions receivable at different sides of said pipe and each carrying at least one of said rollers;

two pivotal connections mounting said body members for swinging movement about two spaced axes respectively between a closed position in which the rollers grip and drive a pipe and an open position releasing the pipe;

an adjustable connection attaching said two pivotal connections together for relative lateral adjusting movement in a relation shifting said pivotal axes toward and away from one another to grip and drive different sizes of pipe;

powered means for swinging said body members about said axes and between open and closed positions in differently spaced conditions of said axes; and

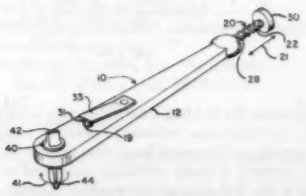
support means attached to said adjustable connection and adapted for connection to a suspending element in a manner suspending said adjustable connection from said element and suspending said pivotal connections and said body members and said rollers from said element through said adjustable connection.

4,425,828

RIGHT ANGLE DRIVE RATCHET SCREW-DRIVER

E. J. Berdinner, Jr., 2045 Meadow Dr., #1, Longmont, Colo. 80501

Filed Nov. 30, 1981, Ser. No. 325,639
Int. Cl.[3] B25B *13/46*
U.S. Cl. 81—57.39 6 Claims



1. Screw-driver apparatus, comprising:

tool means adapted for engaging a screw to transmit angular motion to the screw;

rotor means connected to said tool means for imparting angular motion to said tool means; and

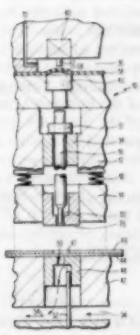
a ratchet wheel on said rotor having a plurality of cogs on its peripheral surface in spaced-apart relation to each other, a push rod positioned with its longitudinal axis perpendicular to the axis of said rotor, and a pawl attached to one end of said push rod and extending into engagement with said ratchet wheel, said push rod being movable longitudinally in a linearly reciprocating manner and biased in a direction away from said ratchet wheel, and said pawl being pivotally attached to said one end of said push rod and extending to engage cogs on one side of said ratchet wheel to rotate said rotor in one angular direction as said push rod is moved in a linearly reciprocating manner, and wherein said pawl is movable to an alternate position extending from the push rod to engage cogs on the opposite side of said ratchet wheel to rotate said rotor in the opposite angular direction as the push rod is moved in the linearly reciprocating manner.

4,425,829

PUNCH APPARATUS

John R. Kranik; George E. Melvin, both of Poughkeepsie, and Wolfgang F. Mueller, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,248
Int. Cl.[3] B23B *49/00*; B26D *7/18*
U.S. Cl. 83—62.1 5 Claims



1. An improved interposer punch apparatus for punching small holes in sheet material having a plurality of elongated punch elements arranged in a matrix, a head slidably supporting the punch elements, means to urge the punch elements in an extended position, a spring biased stripper plate carried by the head with apertures for receiving the lower ends of the punch elements, and a base for supporting a substrate to be punched and having apertures for receiving the lower ends of the punch elements, the improvement comprising

a means in said base to forcibly displace slugs of material punched from a substrate from the ends of said punch elements following a punching operation, said means including enlarged openings on the underside of said base associated with each of said apertures, a plurality of tubes positioned axially adjacent and below the associated said apertures in said base with the upper portions of said tubes located in said enlarged openings, and a means to force air through said tubes to thereby force said slugs of material from the punch ends,

said tubes located in a common enclosure beneath said base with one of the ends of each tube open to the atmosphere, and a vacuum source connected to said enclosure to draw

air through said tubes to thereby remove said slugs of material from said enclosure with a resultant generated current of air.

4,425,830

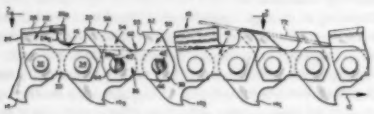
ANTI-KICKBACK SAW CHAIN

Renwick S. Atkinson, Portland, Oreg., assignor to Carlton Company, Portland, Oreg.

Filed Sep. 14, 1981, Ser. No. 301,840

Int. Cl.³ B27B *33/14*

U.S. Cl. 83—833 **9 Claims**



1. A saw chain comprising:

a series of left and right hand cutter links disposed alternately on opposite sides of the chain, and other links pivotally connected to each other and to the cutter links to complete the chain,

each cutter link including an upwardly projecting depth gauge adjacent the forward end of the link and a cutter portion including a top blade trailing the depth gauge, the cutter portion having a forward cutting edge extending above the height of the depth gauge, the top blade of the cutter portion inclining downwardly progressing rearwardly in the cutter link,

said other links including a center link for each cutter link pivotally connected adjacent its rear end to the forward end of the cutter link and a safety link for each cutter link pivotally connected adjacent its rear end to the center link and on the opposite side of the chain from the cutter link,

the safety link including a leading projection adjacent the forward end of the link and a trailing projection adjacent the rear end of the link, said leading and trailing projections being separated by a gullet disposed intermediate the projections, the leading projection and the trailing projection, with the chain extending in a straight line, projecting upwardly from the chain no higher than the depth gauge but at least a major portion of the height of the depth gauge, said trailing projection also projecting rearwardly to overlap the depth gauge.

4,425,831

ELECTRIC GUITAR TRANSDUCER MOUNTING

Barry Lipman, 1186 Post Rd., Scarsdale, N.Y. 10583

Filed Mar. 11, 1982, Ser. No. 356,946

Int. Cl.³ G10H *3/00*

U.S. Cl. 84—1.16 **12 Claims**

1. An electric guitar having guitar strings and wiring for coupling of a transducer supported adjacent the guitar strings to an amplifier, said guitar comprising: a guitar body defining the outer contours of the guitar with the strings anchored to said body with an opening extending through from the front to the back of said body; a module containing the transducer dimensioned to fit into and removably mounted in said guitar body opening from the back of said body; and electrical connections in said body between said module and the guitar wiring, whereby the transducer may be selectively removed without disturbing the guitar strings.

4,425,832

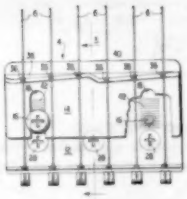
ADJUSTABLE BRIDGE FOR MUSICAL INSTRUMENT

Hartley D. Peavey, Meridian, Miss., assignor to Peavey Electronics Corp., Meridian, Miss.

Filed Feb. 2, 1982, Ser. No. 345,089

Int. Cl.³ G10D *3/04*

U.S. Cl. 84—298 **10 Claims**



1. An adjustable bridge for a stringed musical instrument comprising:

a baseplate including a first generally flat part adapted to be secured to the body of said instrument, and a second part integral with said first part and extending outwardly from said first part, and adapted to receive strings for said instrument, and

a saddle, consisting of a single element having a first generally flat portion adapted to be secured to said first part of said baseplate, and a second portion integral with said first portion, and projecting from an edge of said first portion and adapted to act as a nodal point for said strings.

4,425,833

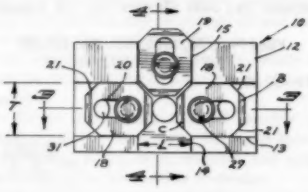
CARTRIDGE CASE HOLDER APPARATUS

Clarence E. Purdie, deceased, late of Faribault, Minn. by Irene D. Purdie, executor, assignor to Gopher Shooter's Supply Company, Incorporated, Faribault, Minn.

Filed Aug. 27, 1982, Ser. No. 412,157

Int. Cl.³ F42B *33/00, 35/02*

U.S. Cl. 86—44 **7 Claims**



1. Apparatus for holding a cartridge case having a cannelure during a cartridge case reloading operation comprising a jaw mount having an elongated linear first groove having an intermediate portion, a linear cartridge case feed second groove opening to the first groove intermediate portion, a linear third groove opening to the first groove intermediate portion opposite the opening of the second groove to the first groove and

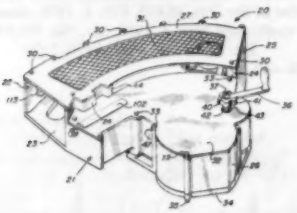
extending at right angles to the first groove, the first, second and third grooves in part being defined by jaw mount inner walls that are coplanar, and a bore opening through the first groove inner wall in centered relationship to the openings of the second and third grooves to the first groove and extending through the jaw mount, a first jaw and a second jaw mounted in the first groove for slidably movement on diametric opposite sides of the opening of the bore to the first groove, a third jaw slidably mounted in the third groove, each jaw having a slot elongated in a direction that extends radially relative the bore and a lip extendable into the cartridge case cannelure, and a screw for each jaw extended through the respective jaw slot and threaded into the jaw mount for retaining the respective jaw in the respective groove in fixed selected adjusted radial positions relative the bore.

4,425,834

MUNITIONS DISPENSER

Arthur M. Lohmann, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 29, 1981, Ser. No. 288,096
Int. Cl.³ F41F *5/00*
U.S. Cl. 89—1 A **9 Claims**



1. Apparatus for dispensing mines of short, circularly cylindrical configuration about a spin axis, comprising, in combination:

a housing having an opening;

an arm mounted in said housing for angular movement about a first pivotal axis between first and second positions;

resilient means actuating said arm toward said second position;

drive means operable to move said arm to, and releaseably hold said arm in, said first position;

a cylindrical friction member arcuate about said first pivotal axis from a site adjacent to said opening; and

a holder mounted on said arm to receive a mine with its spin axis parallel to said pivotal axis and with its cylindrical surface in engagement with said friction member,

so that when said arm is moved into said first position and released, a mine in said holder is propelled along said friction member and is ejected through said opening, while rotating about said spin axis.

4,425,835

FLUID ACTUATOR

Eugene L. Krasnoff, Princeton, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 26, 1981, Ser. No. 228,383
Int. Cl.³ F01L *25/02*; F01B *7/18*
U.S. Cl. 91—317 **6 Claims**

1. An actuator comprising:

(a) a housing;

(b) a fluid source for supplying pressurized fluid to the actuator;

(c) a piston chamber within the housing;

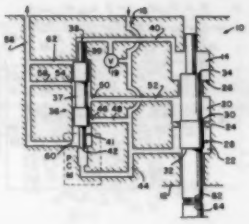
(d) a piston disposed within the piston chamber said piston having:

i. a first piston means for moving the piston in a first piston direction;

ii. a second piston means for moving the piston in a second piston direction; and

iii. a third means for producing an increasing and decreasing fluid pressure source as the piston reciprocates;

(e) a valve means for actuating the first and second piston means to reciprocate the piston wherein said valve means



communicates with the fluid source producing a first force on the valve means and said valve means communicates with the increasing and decreasing pressure source causing an increasing and decreasing second force on the valve means; and

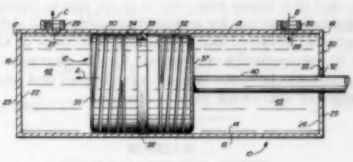
(f) a pressure control means for varying the fluid source pressure acting on the valve means wherein the piston reciprocating frequency is modified.

4,425,836

FLUID PRESSURE MOTOR

John W. Pickrell, Scottsdale, Ariz., assignor to Government Innovators, Inc., Phoenix, Ariz.

Filed Feb. 20, 1981, Ser. No. 236,145
Int. Cl.³ F15B *15/22*
U.S. Cl. 91—405 **10 Claims**



1. In a fluid pressure motor including

a cylinder having a bore and an end wall,

a piston reciprocally movable within said cylinder and having a face opposing said end wall and an outer surface,

a variable volume chamber defined within said bore between the end wall of said cylinder and the face of said piston, and

a port in said cylinder for the transfer of said fluid to and from said chamber,

the outer surface of said piston effectively closing said port during the terminal portion of movement of said piston in a direction toward the end wall of said cylinder,

improvements therein for regulating the transfer of said fluid between said chamber and said port and for decelerating and cushioning said piston during said terminal portion of movement, said improvements comprising:

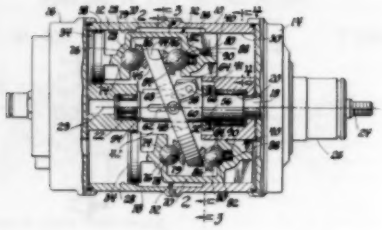
a channel formed into the outer surface of said piston for the transfer of said fluid from said chamber to said port, said channel forming a helix about said piston having a pitch such that at least a portion of said channel is in constant communication with said port during the terminal portion of movement of said piston.

4,425,837

VARIABLE DISPLACEMENT AXIAL PISTON MACHINE

J. D. Livesay, Tipp City, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 28, 1981, Ser. No. 305,927
Int. Cl.³ F01B 3/02
U.S. Cl. 92—71 4 Claims



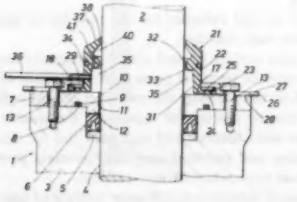
1. A variable displacement axial piston machine having piston guide means stationarily aligned with an axial working piston cylinder, a single-headed piston having a piston head at one end reciprocally mounted in said working piston cylinder and piston guide means at the opposite end for cooperating with said first-mentioned guide means to prevent tilting of said piston head in said working piston cylinder during piston reciprocation, a shaft supported for rotation about a rotary axis extending longitudinally of and radially spaced from said piston, a rotary swash plate with flat parallel sides, swash plate-shaft drive means for fixedly drivingly and pivotally interconnecting said swash plate and shaft so that said swash plate rotates with said shaft while being pivotal about a pivot axis transverse to said rotary axis, swash plate-piston drive means for slidably drivingly and pivotally interconnecting said sides of said swash plate with said piston to effect reciprocation of said piston on rotation of said shaft and vice versa and wherein the piston stroke and thereby displacement is made to vary by pivoting said swash plate to various angles relative to said shaft, and said swash plate-piston drive means including axial compensating means for maintaining continuous sliding drive engagement between said piston and both sides of said swash plate to automatically compensate for the change in effective axial thickness between said sides relative to said piston when the angle of said swash plate is changed.

4,425,838

FLUID CONTROL DEVICE

Aaron J. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.

Filed Jul. 16, 1981, Ser. No. 284,009
Int. Cl.³ F01B 31/00
U.S. Cl. 92—86 16 Claims



1. In a cylinder-moving shaft combination wherein at least a portion of said shaft protrudes from said cylinder, said apparatus further having a stuffing box assembly for sealing around said shaft, the improvement comprising a fluid collection device for fitting about said portion of said moving shaft protruding from said cylinder for the collection of fluid at a collection point, said device comprising:

a generally cylindrical body of a flexible material having an axial passage formed therethrough for receiving said moving shaft, said cylindrical body including (a) a sealing flange extending radially outwardly from one end of said body to form a fluid-tight seal with a portion of said stuffing box assembly, (b) an inwardly extending elastomeric collar formed within said cylindrical body for engaging the shaft in a circular wiping fashion to form a first annular fluid receiving space, (c) a circular open end spaced from the moving shaft to form a second annular fluid receiving space, and (d) means providing open fluid communication between said first annular space and said second annular space whereby fluid which passes the wiping action of said collar is drained back into said first annular space; and

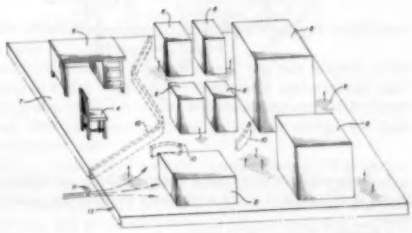
a drain line leading from said first annular space.

4,425,839

FLEXIBLE AIRDUCT AND DEFLECTOR SYSTEM

W. John Stull, 707 Monroe St., Endicott, N.Y. 13760

Continuation of Ser. No. 10,603, Feb. 8, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,541
Int. Cl.³ F24F 7/00; A47G 5/00
U.S. Cl. 98—40 R 5 Claims



1. An air distribution system for introducing thermally conditioned air upwardly throughout only a specified portion of the floor area of a room, thereby creating a desired temperature differential between that part of said room above said specified portion of the floor area and the remaining part of said room above that portion of the floor area other than said specified portion, said system facilitating fast and simple selective adjustment of the portion of said floor area comprising said specified portion, said system comprising:

(a) flooring means defining the lower horizontal surface of said room;

(b) sub-flooring means arranged below and in spaced relation to said flooring means to define a space separated from the lower side of said room by said flooring means;

(c) a plurality of small, closely spaced openings extending through said flooring means over substantially the entire area thereof through which said space communicates with said room;

(d) at least one elongated, flexible, resilient element arranged within said space along a predetermined path and extending between said sub-flooring and said flooring means to separate said space into a first area, below said specified portion of said floor area, and a second area below said portion other than said specified portion;

(e) means securing said element to said sub-flooring means to define said predetermined path; and

(f) means for introducing a supply of thermally conditioned air into said first area of said space, whereby said conditioned air may pass from said space into said room only

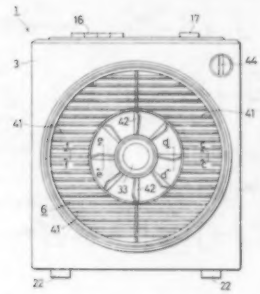
through the openings in said flooring means within said specified portion of the area thereof.

4,425,840

BLOWER

Morimoto Masao, Kasai, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Oct. 23, 1981, Ser. No. 314,221
Claims priority, application Japan, Nov. 25, 1980, 55/166224
Int. Cl.³ F24F *13/10;* **F04D** *25/10*
U.S. Cl. 98—40 V **4 Claims**



1. A blower comprising:
a body case having at least a front opening;
an axial flow fan mounted in said body case;
means coupled to said axial flow fan for driving said axial flow fan;
a generally circular rotating deflector means having a center, mounted in said front opening of said body case for a free rotation therein, wherein said rotating deflector means comprises:
brake changing vanes arranged radially about said center of said deflector and disposed in a substantially circular area concentric with said center of said deflector, said brake changing vanes being responsive to a swirling air flow from said axial flow fan for imparting a braking force in a braking direction to said deflector; and
rotation changing vanes arranged in parallel and disposed in a ring concentric with and circumferential to said brake changing vanes, said rotation changing vanes being responsive to said swirling air flow generated by said axial flow fan for imparting force to said deflector in a rotational direction, said rotational direction being opposite to said braking direction, whereby an airflow is directed over a wide angular range by said blower, said deflector being rotated in said rotation direction at a low speed.

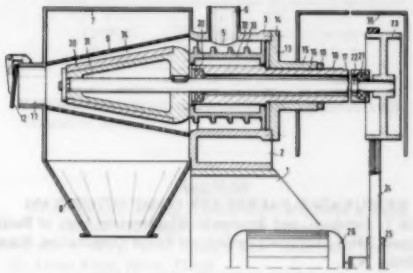
4,425,841

RICE-POLISHING MACHINE

Walter Vick, Hamburg, and Rolf Suhrbier, Norderstedt, both of Fed. Rep. of Germany, assignors to F. H. Schule GmbH, Hamburg, Fed. Rep. of Germany

Filed Jun. 17, 1982, Ser. No. 389,172
Int. Cl.³ B02B *3/00, 7/02*
U.S. Cl. 99—605 **5 Claims**

1. In a rice polishing machine of the type including a housing, a shaft mounted essentially horizontally in said housing, a drive coupling member carried by said shaft on one end thereof for connecting the shaft to a drive source, a polishing rotor carried by said shaft on the end thereof opposite to said one end, a conveyor screw coaxially and fixedly connected to the polishing rotor, the housing being provided with a rice feed orifice at the conveyor screw, and with a rice discharge orifice at the edge thereof remote from the conveyor screw, a screen housing surrounding the polishing rotor at a distance therefrom so as to form a space therebetween for cooperation with the conveyor screw, the polishing rotor and said screen housing being conically tapered, parallel to each other, and having the narrow end thereof pointing towards the rice discharge orifice, and funnel means located essentially underneath said screen housing for collecting and discharging polishing powder, the improvement comprising a housing cover for closing off said housing beyond said rice feed orifice, a bearing tube surrounding said shaft and fastened to the housing cover so as



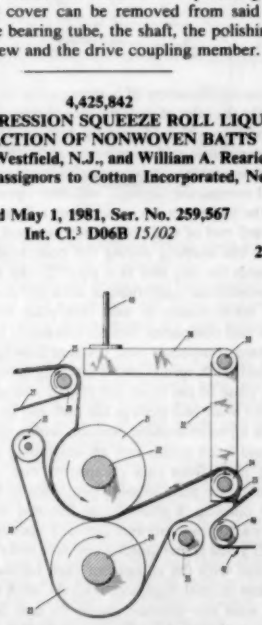
to be axially displaceable within the housing cover, the polishing rotor and said screen housing having the wide end thereof, opposite to the narrow end thereof, said polishing rotor being disposed adjacent to the conveyor screw and mounted on a side thereof by means of said bearing tube, the internal diameter of said housing in the region of the conveyor screw being greater than the maximum diameter of the polishing rotor so that the housing cover can be removed from said housing together with the bearing tube, the shaft, the polishing rotor, the conveyor screw and the drive coupling member.

4,425,842

HIGH EXPRESSION SQUEEZE ROLL LIQUOR EXTRACTION OF NONWOVEN BATTS

Allen R. Winch, Westfield, N.J., and William A. Rearick, Simpsonville, S.C., assignors to Cotton Incorporated, New York, N.Y.

Filed May 1, 1981, Ser. No. 259,567
Int. Cl.³ D06B *15/02*
U.S. Cl. 100—37 **22 Claims**



1. A method of extracting liquor from a non-woven textile fiber batt, comprising the steps of:
conveying a wet textile fiber batt to an upper squeeze roll;
squeezing the textile fiber batt between a porous conveyor belt and the upper squeeze roll to expel a fraction of the liquor carried by the textile fiber batt, said fraction of the

liquor being gradually expelled as the textile fiber batt is progressively squeezed between the porous conveyor belt and the upper squeeze roll;

carrying said textile fiber batt through a nip defined by said upper squeeze roll and a lower squeeze roll to expel additional liquor from the textile fiber batt; and

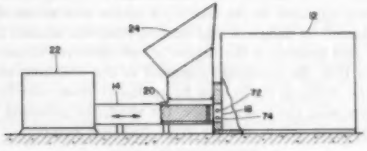
conveying the textile fiber batt away from the nip on the conveyor belt.

4,425,843

REMOVABLE FACEPLATE COMPACTOR RAM

David T. Jacobsen, and Jerome P. Klopfenstein, both of Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,856
Int. Cl.³ B30B *15/06*
U.S. Cl. 100—229 A **8 Claims**



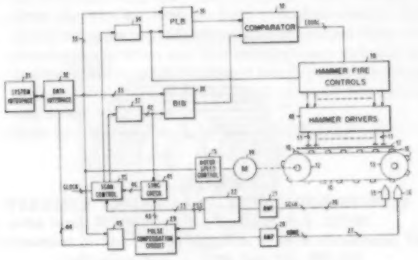
1. In the combination of a storage bin having at least one opening for the inlet of material into said bin with a compactor communicating with said opening; hopper means for supplying solids material into said compactor; and compactor ram means reciprocable within said compactor for conveying the material from said compactor through said inlet opening into the storage bin; the improvement comprising: a face plate mounted on the forward end of said compactor ram and being adapted to enter said bin opening during the compacting stroke of said ram towards the bin, said face plate having peripheral dimensions in substantial conformance with the size of said bin inlet opening; latch means on said face plate normally engaging means on said compactor ram for releasably fastening said face plate to said compactor ram; resilient biasing means normally biasing said latch means into a latching position for fastening said face plate to the head end of said compactor ram; means engageable with said storage bin and said face plate when the latter is in a predetermined position within the bin opening for biasing said latch means into an unlatching position releasing said face plate from said compactor ram and concurrently locking said face plate to said storage bin to form a closure for said inlet opening; a guide frame fastened to the head end of said compactor ram circumferentially encompassing said face plate, said guide frame guiding said face plate into said latching engagement with the compactor ram, recesses formed in said guide frame in axial alignment with the latch means of said face plate; at least one conduit means on said face plate in axial alignment with said recesses and a through-bore in said storage bin axially aligned with said recesses and said latch means in the forward position of said compactor ram, said engaging means being insertable through said through-bore, recesses and conduit means to bias said latch means into a position for releasing said face plate from said compactor ram and locking said face plate to said storage bin.

4,425,844

HOME PULSE COMPENSATION FOR MULTIPLE SPEED LINE PRINTER

James E. Carrington, Vestal; Michael D. Hryck, Endwell; Dean W. Skinner, Binghamton, and Gerald R. Westcott, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,313
Int. Cl.³ B41J *1/18*
U.S. Cl. 101—93.14 **8 Claims**



1. In a printer system wherein a printer mechanism comprises a plurality of type characters movable in a closed path and a plurality of print hammers electrically operable for engaging said type characters at print positions along said path to effect printing of said type characters on a print medium,

drive means for producing constant motion of said type characters at a plurality of speeds relative to said print hammers whereby printing occurs at a corresponding plurality of printing rates,

means for selectively operating said print hammers in timed relation with the motion of said type characters to effect on-the-fly printing at said plurality of print rates including

print control means operable for providing character identifying signals including a reference character signal in synchronism with the motion of said characters at said plurality of speeds,

means for synchronizing the operation of said print controls with said type characters during said motion at said plurality of speeds including,

means for generating reference pulses indicative of the motion of a reference type characters relative to a reference position on said closed path located at a predetermined lead distance from a given print hammer,

said lead distance being a fixed distance dependent on the flight time of said given print hammer to effect engagement with said reference character when moving at one of said speeds,

sync control means connected to said print control means for receiving said character identifying signals,

said sync control being operative for determining the coincidence of said reference character signal from said print control and said reference pulses, and

compensating circuit means connected between said reference pulse generating means and said sync control means,

said compensating circuit means having adjustment means operable for electrically modifying the timing of said reference pulses for application to said sync control means,

said adjustment means being operable for modifying the timing of said reference pulses in accordance with changes in said speed of said type characters by said drive means from said one of said constant speeds.

4,425,845

BANK FOR ACCOMMODATING SEVERAL PRINT RAM UNITS

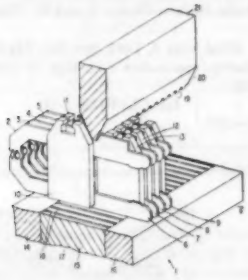
Armin Bohg, Weil im Schoenbuch, and Kurt Hartmann, Calw-Heumaden, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1982, Ser. No. 363,972

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3114835

Int. Cl.³ B41J *9/30*

U.S. Cl. 101—93.34 11 Claims



1. A bank for accommodating at least one print ram unit comprising:

at least one frame having a lower extension piece, an upper extension piece and a first recess lying between said lower extension piece and said upper extension piece;

at least one pair of electromagnetic ram actuators, one of said pair of actuators located on one side of said frame and the other of said pair of actuators located on the opposite side of said frame;

a base part having slits therein to accommodate the lower extension piece of said frame;

a comb part having at least one recess therein to accommodate said upper extension piece of said frame;

at least one print ram arranged in said first recess and operated by said at least one pair of actuators;

a ram head coupled to said print ram for serving as a print hammer; and

a spring means coupled to said lower extension piece for reducing the recoil force on said frame when said print ram is operated;

whereby said frame is arranged between said base part and said comb part.

4,425,846

TYPE BAND AND BAND PRINTER WITH AUTOMATIC PRINT BAND RECOGNITION

Walter H. Sakmann, Herrenberg, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,945

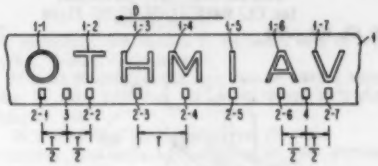
Claims priority, application European Pat. Off., Aug. 6, 1981, 81106152.2

Int. Cl.³ B41J *1/20*

U.S. Cl. 101—111 5 Claims

1. In a rotating exchangeable type character carrier for impact printers capable of operating with a number of different type character carriers where there is a track of equally spaced sensible timing marks associated with the characters which track contains a first sensible non-timing mark positioned between two of the equally spaced timing marks to identify a start point for control processes of the impact printers, the improvement comprising:

a second sensible non-timing mark in said track that is uniquely spaced from the first non-timing mark for each of the different type character carriers between two of the equally spaced timing marks so that the number of timing marks occurring on the track between the first and second



sensible non-timing marks uniquely identifies each type character carrier.

4,425,847

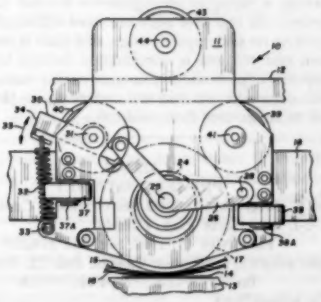
TRAVELING PRESSURE PAD ASSEMBLY FOR MECHANICAL PRINTER APPARATUS

Jacob M. Drillick, 4560 South Cedar Lake Rd., Apt. No. 8, St. Louis Park, Minn. 55416

Filed May 24, 1982, Ser. No. 381,397

Int. Cl.³ B41F *3/16*

U.S. Cl. 101—269 3 Claims



1. Apparatus for applying printing forces upon a surface to be printed and comprising, in combination:

(a) a main frame, guide rail means, and force applying means mounted upon said guide rail, said force applying means including traveling frame means for said printing force applying apparatus;

(b) first and second drive bearing means rotatably journaled for rotation about first and second axes respectively within said traveling frame means, and arranged to normally contact the surface of said guide rail to impart rotation to said drive bearing means;

(c) pressure ring means mounted for rotation within said traveling frame means, with said pressure ring means being rotatably journaled for floating rotation generally about idler puck means rotatably journaled on a third axis, said first and second axes being disposed on opposite side of said third axis and intermediate said third axis and said guide rail means, with the peripheral surface of said pressure ring being arranged in running contact with the periphery of said drive bearing means; and

(d) mechanical bias means for normally forcing the outer surface of said pressure ring means into contact with the periphery of said drive bearing means so as to impart rotational motion to said pressure ring prior to contact being established between said pressure ring and the surface to be printed.

4,425,848

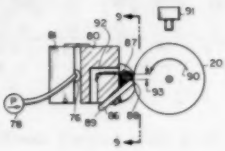
FLEXOGRAPHIC INK DISTRIBUTION SYSTEM

Clinton C. Bell, 4925 Torrey Pines Ct., Charlotte, N.C. 28211

Division of Ser. No. 266,890, May 26, 1981. This application Jun. 28, 1982, Ser. No. 392,651

Int. Cl.³ B41F *31/04, 31/06, 31/36*

U.S. Cl. 101—350 **7 Claims**



1. A system for applying and then removing in metering fashion ink from a roll comprising:

first means including ink and having an outlet adjacent said roll operable to apply ink to said roll;

second means operable to meter and remove ink from said roll and including a member with an outer surface with parallel ridges thereon separated by grooves to receive ink from said roll as said ridges contact said roll and remove ink therefrom, said member is a plate with a first edge adjacent said roll and an opposite parallel edge, each edge having a series of said grooves formed thereon, said grooves on said first edge are sized differently from said grooves on said opposite edge, said plate is mounted adjacent said roll and is remountable thereon to locate said opposite edge in the position previously occupied by said first edge adjacent said roll depending on the amount of ink to be metered from said roll.

4,425,849

PRIMER ASSEMBLY

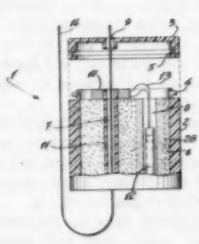
Gordon K. Jorgenson, Dollard des Ormeaux, Canada, assignor to C-I-L Inc., North York, Canada

Filed May 17, 1982, Ser. No. 379,007

Claims priority, application Canada, Jun. 22, 1981, 380677

Int. Cl.³ F42B *3/10;* **F42C** *19/08*

U.S. Cl. 102—275.12 **10 Claims**



1. A primer assembly for initiating explosives in a vertical borehole by means of electric blasting caps which are initiated electromagnetically comprising:

(a) a priming charge of high explosives,

(b) a cylindrical, open-top, cup-like container body having means thereon to support a toroid transformer element and attached lead wires and electric blasting cap, said blasting cap being positioned in detonating relationship with the said priming charge of high explosives, and

(c) an interlocking cover for said cylindrical cup-like container,

the said cylindrical cup-like container and interlocking cover having apertures therein at a location in alignment with the hollow center of the said toroid transformer element, said apertures being at least of a size to permit free slidable passage therethrough of an insulated electric wire having a diameter of at least 1.15 mm.

4,425,850

DEVICE FOR INITIATING AN EXPLOSIVE CHARGE WITH DAMMING MEANS OF NON-EXPLOSIVE SHOCK WAVE ATTENUATING MATERIAL BETWEEN THE OUTER BOOSTER AND THE LINER

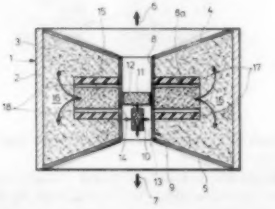
Peter Grössler, Hochstadt, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm G.m.b.H., Fed. Rep. of Germany

Filed May 8, 1981, Ser. No. 261,705

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019948

Int. Cl.³ F42B *1/00*

U.S. Cl. 102—307 **18 Claims**



1. An explosive device comprising:

a case in the form of a body of rotation about a central axis and defining an open face;

an explosive charge in the case;

at least one fragmentable lining covering the open face and the explosive charge, the explosive charge shaped to explode and fragment the lining substantially in an effective direction parallel to the central axis;

the explosive charge having a recess therein symmetrical about the axis and extending in the explosive charge and symmetrical about a central vector of the effective direction;

an inner booster charge substantially at a center of the recess;

an outer booster charge positioned around the inner booster charge and extending into the recess; and

damming means covering at least a portion of the outer booster charge made of non-explosive shockwave attenuating material and between the outer booster and the liner.

4,425,851

HIGH SPEED PASSENGER TRANSFER VEHICLE

Alvin L. Long, Civilian Gen. Del. Beale A.F.Bs, Calif. 95903

Continuation-in-part of Ser. No. 234,336, Feb. 17, 1981, abandoned. This application Mar. 18, 1982, Ser. No. 359,582

Int. Cl.³ B61K *1/00*

U.S. Cl. 104—20 **2 Claims**

1. In a high-speed train that is supported by track, the improvement comprising;

(1) a self-propelled vehicle, carried on top of said train and adapted to be suspended on a monorail at a depot, for subsequent release from said train;

(2) a magnetic collar means on the bottom of said self-propelled vehicle, and on the top of said train, said magnetic collar means adapted to hold said self-propelled vehicle to the top of said train;

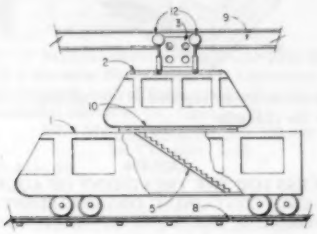
(3) means for transferring passengers to and from said train, said transferring means comprising;

(A) a stairway means extending from said train to said self-propelled vehicle to allow access to passengers

between said train and said self-propelled vehicle via said magnetic collar means;

(B) a horizontal sliding door means mounted in said magnetic collar means between said train and said self-propelled vehicle;

(4) power driven wheel means mounted on retractable arms on said self-propelled vehicle, said power driven wheel means on said vehicle adapted to be extended to securely grasp said monorail at a train depot;



(5) shackle means mounted on said train on retractable arms to hold said self-propelled vehicle to said train during normal travel between depots, said shackle means adapted to be released to permit release of said self-propelled vehicle from said train at a train depot;

whereby said self-propelled vehicle is detached from said train and attached to said monorail at a train depot in preparation to discharge passengers ascended from said train to said vehicle via said stairway means through said magnetic collar means.

4,425,852

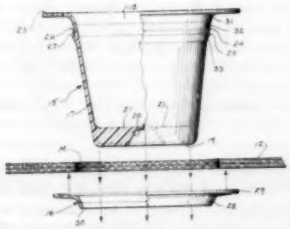
PALLET CONSTRUCTION

Donald L. Riviere, Neenah, Wis., assignor to Menasha Corporation, Neenah, Wis.

Filed Nov. 4, 1981, Ser. No. 317,792

Int. Cl.³ B65D *19/26, 19/40*

U.S. Cl. 108—56.3 **9 Claims**



1. In a pallet having a platform and feet anchored to the platform to space the platform from the floor, each of said feet comprising a cup-like member oriented with the mouth opening upwardly and having an outwardly and peripherally extending flange at the upper extremity thereof, said cup-like member being insertable within a suitable hole in the platform to place the underside of the flange thereon into engagement with the upper platform surface adjacent to the hole, said cup-like member having an outwardly projecting, upwardly facing shoulder exteriorly thereof and spaced beneath the flange, said shoulder in the assembly of the cup-like member to the platform being also spaced beneath the platform, and a locking ring member having an outwardly and peripherally extending flange disposed upwardly and a shoulder engaging surface disposed downwardly beneath its flange, said locking ring member being adapted for disposal beneath the platform and exteriorly on the cup-like member to engage upon the shoulder of the cup-like member and sandwich the platform between the opposed flanges of said members.

4,425,853

CASH SAFE

Jon D. C. McGregor, and Deanna E. Richards, both of 3/52 Grange Rd., Toorak, Australia 3142

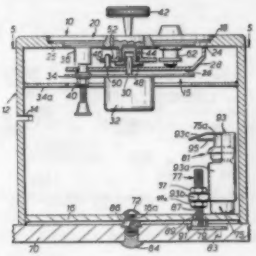
PCT No. PCT/AU80/00082, § 371 Date Jun. 26, 1981, § 102(e) Date Jun. 26, 1981, PCT Pub. No. WO81/01325, PCT Pub. Date May 14, 1981

PCT Filed Oct. 31, 1980, Ser. No. 279,963

Claims priority, application Australia, Oct. 31, 1979, PE1145; Oct. 31, 1979, PE-1151

Int. Cl.³ E05G *1/12;* **E05B** *43/00*

U.S. Cl. 109—25 **16 Claims**



1. A cash safe comprising a hollow safe body having an opening for removal of the contents from the safe, a closure positionable on said receptacle to close said opening, locking means mounted on said closure and actuatable to lock said closure over said opening and deactuatable to unlock said closure, timing means operable in response to actuation of said locking means to preclude deactuation for a time period after said actuation, said locking means comprising a locking member cooperatively connected to said timing means to be rotatable at a predetermined rate by said timing means to move the locking member from an actuated rotational locking position assumed pursuant to said actuation, to a deactuated rotational unlocking position, abutment means on said safe body, said locking member co-operating with said abutment means when at a rotational position other than said deactuated position to lock said closure, and, when at said deactuated position, to unlock said closure, said timing means comprising a clock timer having an actuating member and actuated by rotation of said actuating member in a predetermined direction to a predetermined extent, and subsequently operating to rotate said actuating member in the direction opposite to said predetermined direction at said predetermined rate whereby said time period is dependent upon said predetermined extent to which said actuating member is rotated, and means selectively operable to, in one position, interrupt operation of said timing means and in another position to release said interruption of operation and restore the timing means to operation.

4,425,854

MICRONIZED COAL BURNER FACILITY

Frederick D. Calfo, Elyria, and Michael W. Lupton, Strongsville, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 30, 1982, Ser. No. 393,588

Int. Cl.³ F23C *1/10, 1/12*

U.S. Cl. 110—262 **9 Claims**

1. In a system for burning a coal-in-oil fuel mixture (COM)

to provide a flame which produces substantially only submicron ash particles, the combination of:

a burner unit comprising:

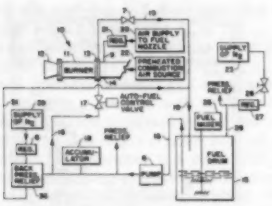
a cylindrical burner section having first and second ends and a cylindrical inner surface;

a flame exit nozzle disposed at said first end of said burner section, said nozzle having a throat whose diameter is substantially less than the diameter of the inner surface of said burner section;

a sonic fuel spray nozzle disposed in said burner section just inwardly of said second end and having a longitudinal passageway extending therethrough to a nozzle orifice, one or more passageways extending radially outwardly from said longitudinal passageway adjacent said nozzle orifice;

an ignitor extending into said burner section;

means for delivering air heated to at least 300° C. to said burner section at a pressure greater than 1 psi gage;



means for supplying fuel at a prescribed pressure to said one or more radial passageways in said nozzle; and

means for supplying regulated air pressure to said longitudinal passageway whereby said fuel is atomized at said nozzle orifice, combustion in said burner section occurring at about 1 psi gage;

said means for supplying fuel at a prescribed pressure to said one or more radial passageways in said spray nozzle comprising,

a fuel supply source;

a fuel return line communicating said one or more radial passageways with said fuel supply source;

a fuel delivery line communicating said radial passageways through a fuel control valve and a pump to said fuel supply means;

pressure relief regulator means connected from said fuel return line to a point in said fuel delivery line between said pump and said control valve whereby two paths are provided for return of excess fuel to said supply source.

4,425,855

SECONDARY AIR CONTROL DAMPER ARRANGEMENT

Roman Chadshay, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 4, 1983, Ser. No. 471,975

Int. Cl.³ F23D *1/00*; F23K *3/02*

U.S. Cl. 110—263 **5 Claims**

1. A system for providing secondary air to a windbox of a tangentially-fired furnace, including,

a source of secondary air,

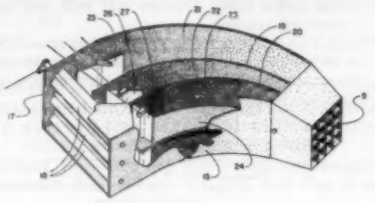
a conduit mounted on the furnace wall outside the furnace and connected to the source,

a transition conduit section connected to the secondary air conduit extending through the furnace wall and into a vertically tiltable nozzle having multi-openings,

at least one turning valve mounted in the transition conduit section upstream of the tiltable nozzle to form a plurality of channels in the transition conduit section,

an air flow control structure mounted in each channel formed by the turning vane,

and a control means for each air flow control structure arranged to be operated from external the furnace in order to determine the velocity and distribution pattern of the



total secondary air supplied to the openings of the nozzle from the channels.

4,425,856

PROCESS FOR THE TREATMENT OF AQUEOUS EFFLUENTS CONTAINING ORGANIC SUBSTANCES AND INORGANIC SALTS AND APPARATUS FOR USE THEREIN

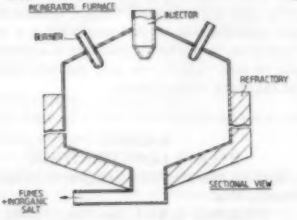
Ferenc Szilagyi, Antony, France, assignor to Rhone- Poulenc Industries, Paris Cedex, France

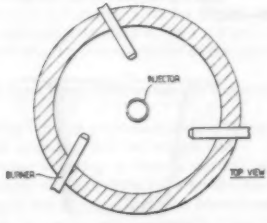
Filed Jun. 10, 1981, Ser. No. 272,280

Claims priority, application France, Jun. 13, 1980, 80 13165

Int. Cl.³ F23G *5/00*

U.S. Cl. 110—346 **2 Claims**





1. A process for the treatment of aqueous effluents containing organic waste and possibly inorganic salts, which comprises burning the said effluent in an incinerator comprising a vertical cylindrical furnace, by spraying the said effluent by an injector, using an excess of air as the supporter of combustion, the sprayed effluent jet passing through the flames of liquid or gaseous fuel burners located towards the upper part of the furnace, arranging the said burners almost tangentially to the perimeter of the furnace and orientated towards the base of the furnace, creating a turbulence which entrains any salt present towards the center and preventing its deposition on the walls of the furnace, the burners being arranged symmetrically in the upper part of the furnace so that the projection of their orifices onto a plane perpendicular to the axis of the furnace is located inside a ring, the radius of which is between the radius and half the radius of the furnace, and being orientated in a horizontal plane and in a vertical plane, defining the said orientation by the dihedral angle formed by the vertical half-plane passing through the axis of the burner and by the vertical half-plane passing through the axis of the furnace and the orifice of the

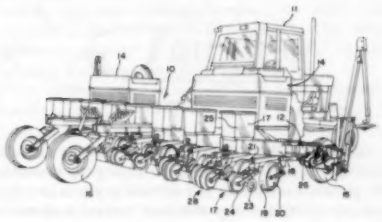
burner, this angle being between 120° and 160°, and the extension of the axis of the burner being tangential to an imaginary vertical cylinder, the radius of which is at least 0.35 times the radius of the furnace, and by the angle of inclination of the burner towards the bottom of the furnace, the said angle of inclination being between 10° and 60°, and creating a pressure reduction at the base of the furnace through the discharge orifice for the fumes and any salt formed, and optionally recovering any salt obtained.

4,425,857

LOCK-UP MECHANISM FOR A PLANTER ROW UNIT

Darlo E. Lienemann, Darien; Donald L. Ledermann, and Nicholas H. Wunschl, both of Bolingbrook, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Mar. 15, 1982, Ser. No. 358,069
Int. Cl.³ A01C *5/00*
U.S. Cl. 111—85 **11 Claims**



1. A planter row unit comprising:

a parallel bar linkage, said linkage being adapted for attachment to a planter, said linkage including dual spaced upper and lower bars, said lower bars having curved slotted openings;

a row unit frame having furrow forming means, furrow closing means, and seed dispensing means, said upper bars being pivotally connected to said frame, pin means mounted on said frame and moveable in said slotted openings in said lower bars between a lowered unit working position and a raised non-working position;

locking means pivotally mounted on said lower bars, said locking means having detents for locking the frame pin means in lowered working and raised non-working positions, said detents being notches elongated in the direction of said linkage and preventing disengagement of said locking means until said frame member is lifted therefrom before subsequent lowering to the working position; and

downstop means for the frame in the working position, said down stop means comprising a pair of spaced rollers mounted on said frame, with each roller engaging a lower bar.

4,425,858

MEANS FOR PROCESSING SHEETS OF MATERIAL

Francis B. Hargett, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,628
Int. Cl.³ D05B *21/00*; B65H *39/02*
U.S. Cl. 112—121.12 **10 Claims**

1. Apparatus for automatically aligning, folding, trimming and stitching a sheet of fabric material, comprising

table means having a starting position and an alignment position with a plurality of sensors for sensing three edges of a sheet of material when appropriately aligned;

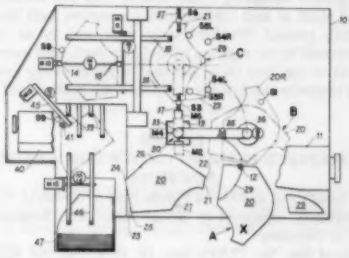
a folder mounted on said table means and having a pair of oppositely rotating rollers forming a nip therebetween;

arm means having a contact member for engaging and moving a sheet of material from said starting position to said alignment position and for releasing said sheet of material when aligned;

means for moving said arm means with said sheet of material laterally and longitudinally and for rotating said contact member and said sheet of material for axially aligning a desired fold line of the material with the nip of said rollers;

means for longitudinally moving said aligned sheet of material to said folder and for urging the material at the desired fold line into the nip of said rollers;

means for delivering said sheet of material with the desired fold first to a sewing machine with a reciprocating needle



and a feed dog for the edge of said sheet of material being stitched;

blade means adjacent said needle for trimming the edge before stitching;

friction means inboard of said needle engaging and forming a fixed center of said sheet of material while its edge is being stitched;

means for sensing the edge of said sheet of material;

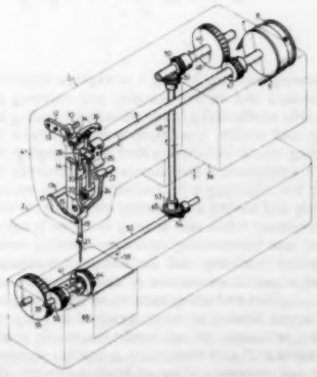
and means for moving said friction means in response to said sensing means for changing the fixed center of said sheet of material according to variations in the profile and said sensed edge.

4,425,859

ZIG ZAG SEWING MACHINE

Elichi Ishitani, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 16, 1981, Ser. No. 244,006
Claims priority, application Japan, Apr. 11, 1980, 55-48464
Int. Cl.³ D05B *3/06*
U.S. Cl. 112—158 R **5 Claims**



1. A zig zag sewing machine comprising;

a frame including an arm and a bed,

an arm shaft rotatably supported on said arm and having a crank member at one end, said arm shaft being rotatable in the clockwise direction as seen from said crank member end thereof,

a needle bar operatively connected with said crank member through a crank rod for reciprocating motion,

a needle supported on said needle bar,

means for effecting lateral movement of said needle bar in a plane perpendicular to the axis of said arm shaft,

a bed shaft rotatably supported on said bed in parallel with said arm shaft, said bed shaft and said arm shaft extending in opposite directions from the reciprocating path of said needle, and

a loop taker including a loop seizing beak and secured to the bed shaft at said corresponding position, said loop taker being rotated synchronously with and in an opposite direction to the rotation of said arm shaft, said loop seizing beak of the loop taker and said bed shaft being positioned on opposite sides of the reciprocating path of said needle.

4,425,860

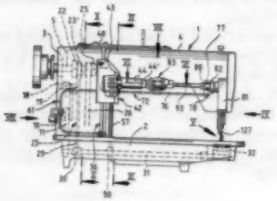
WORKPIECE FEEDING DEVICE FOR A SEWING MACHINE

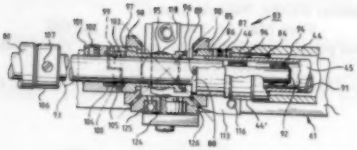
Günter Landwehr, and Horst Thiele, both of Bielefeld, Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Division of Ser. No. 77,143, Sep. 19, 1979, Pat. No. 4,271,776. This application Oct. 1, 1980, Ser. No. 192,911

Int. Cl.³ D05B *27/22*

U.S. Cl. 112—311 **2 Claims**





1. In a sewing machine having a workpiece supporting base plate, a standard and an overhanging arm carrying a presser bar, a movable needle and a longitudinally extending arm shaft for driving said needle, a workpiece feding device having a lower feeding means including a feed dog engaging the lower surface of a workpiece, a mechanism synchronously driven to said needle for imparting a four motion feeding movement to said feed dog and having a regulating means for reversing said feeding movement while said sewing machine is operative or inoperative, and transmitting means connecting said mechanism with said feed dog and including an oscillating shaft transmitting a partial movement of said four motion feeding movement as a feed and idling motion; an upper feeding means having an upper feeding element arranged to cooperate with said feed dog in the area of said needle in a steady contact with the upper surface of said workpiece, a bracket secured to said presser bar and carrying said upper feeding element, means for connecting said oscillating shaft with an one-way coupling and means for connecting said one-way coupling with said upper feeding element; and clutch means for shiftably disengaging said one-way coupling from said upper feeding element including a shift mechanism connecting said clutch means with said regulating means.

4,425,861

BOAT WITH INTERIOR ACCOMMODATION SPACE, AND STRUCTURAL PART THEREOF

Seppo Raikamo, Hakalanicatu 5, 94100, Kemi, Finland

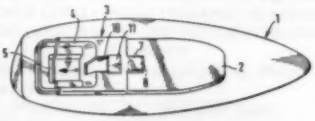
PCT No. PCT/FI80/00014, § 371 Date Jul. 27, 1981, § 102(e) Date Jul. 27, 1981, PCT Pub. No. WO81/01823, PCT Pub. Date Jul. 9, 1981

PCT Filed Dec. 22, 1980, Ser. No. 287,758

Claims priority, application Finland, Dec. 28, 1979, 794093; Apr. 17, 1980, 801220

Int. Cl.³ B63B *29/02*

U.S. Cl. 114—71 **3 Claims**



1. A sliding top for a boat of the type including a cabin and a cockpit spaced from said cabin, the sliding top including:

a first portion having roof and sidewall portions arranged in telescoping relationship with roof and sidewall members of said cabin;

a second portion integral with said forward portion and having deck and sidewall portions arranged in telescoping relationship with deck and sidewall members of said cockpit;

said first and second portions of said sliding top each having a length greater than the spacing between said cabin and said cockpit; and

slide means permitting movement of said sliding top between:

(a) a first position in which said second portion is telescoped relatively to said cockpit deck and sidewall members and said first portion provides an extension of said cabin roof and sidewall members; and,

(b) a second position in which said first portion is telescoped relatively to said cabin roof and sidewall members and said second portion provides an extension of said cockpit deck and sidewall members.

4,425,862

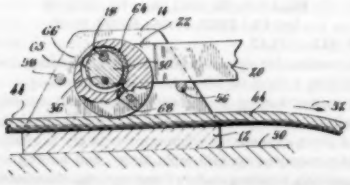
SAIL LINE STOPPER

Jacob Hirsch, 420 North St., Harrison, N.Y. 10528, and A. Allen Lipton, Rock Ridge, Mamaroneck, N.Y. 10543

Filed Aug. 9, 1982, Ser. No. 406,207

Int. Cl.³ B63B *21/04*

U.S. Cl. 114—199 **4 Claims**



1. A sail line stopper adapted to control a line on a sailboat

which line can be released under heavy load without abrading the line comprising:

a U-shaped base member having a pivot pin member in the legs of said U-shaped base, said base adapted to be anchored on a sailboat,

an inner element having a handle attached thereto eccentrically mounted for pivotal movement around said pivot pin,

a moveable outer element positioned for pivotal movement with and rotational movement on said inner element,

spring means mounted between said inner element and said outer element which is acted on by relative movement between said inner and outer elements,

said line adapted to be inserted between said outer element and said base with the rotary movement of said outer element accommodating various size of line,

said spring means being placed in compression when said outer element is pivoted into engagement with the line when said handle is activated toward said line thereby locking said outer element to said line which locking increases as the load increases on said line while allowing said outer member to easily ride over said line in the opposite direction away from the load,

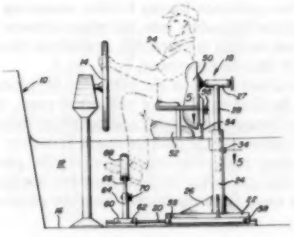
said line being released in said opposite direction when said handle is raised thereby pivoting said outer element away from said line permitting the line to move in the release direction with the outer element moving in the same direction under light spring pressure whereby said line is released easily even under heavy load condition without abrasion as said outer element is permitted to move in the same direction as the released line.

4,425,863

PENDULUM HELMSMAN SEAT

Terrill D. Cutler, 518 Kendall Ave., Los Angeles, Calif. 90042

Filed Mar. 3, 1981, Ser. No. 240,118
Int. Cl.³ B63B *29/12*
U.S. Cl. 114—363 **5 Claims**



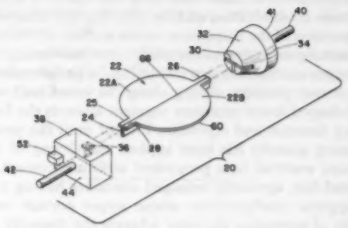
1. In combination with a sailboat hull subject to roll movement including a rudder control member oscillatable about a first fore and aft extending horizontal axis, a helmsman's seat including mounting structure defining a base portion mounted in said hull and a mount portion supported from said base portion for adjustable vertical shifting relative thereto, a seat structure, support means oscillatably supporting said seat structure from said mount portion in pendulum fashion for swinging about a second fore and aft extending horizontal axis with said first and second axes disposed at least generally in the same vertical plane and said mount portion being vertically adjustable relative to said first axis to enable at least general alignment of said axes, said support means including adjustable friction brake means operative to adjustably vary frictional resistance to oscillation of said seat structure relative to said mount portion.

4,425,864

ROTOR FOR ELECTROMAGNETIC INDICATOR

Alfred Skrobisch, Commack, N.Y., assignor to The Staver Company, Inc., Bay Shore, N.Y.

Filed Feb. 5, 1982, Ser. No. 346,373
Int. Cl.³ G01D *5/12*; G08B *5/24*
U.S. Cl. 116—204 **9 Claims**



1. A rotor for an electromagnetic indicator, comprising a flat disk having means integrally connecting magnet at one edge and a stop block at the opposited edge, said flat disk made of lightweight material:

said connecting means including integral tabs extending outwardly of the opposite edges of said disk; and

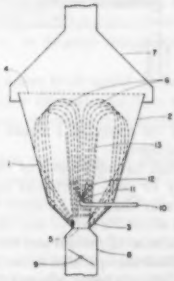
a reinforcing rib integral with said disk and said tabs, said rib extending across said disk centrally thereof in a plane perpendicular thereto beyond the opposite edges thereof to outer ends of said tabs.

4,425,865

METHOD FOR THE HOMOGENEOUS COMPLETE ENCAPSULATION OF INDIVIDUAL GRAINS OF POURABLE MATERIAL AND APPARATUS FOR ITS PRODUCTION

Ernst L. Hörner; Jürgen C. Knolle, both of Eschwege, and Hans Grimm, Meinhard, all of Fed. Rep. of Germany, assignors to Saat- und Erntetechnik GmbH, Eschwege, Fed. Rep. of Germany

Division of Ser. No. 207,651, Nov. 17, 1980. This application Jun. 23, 1982, Ser. No. 391,241
Int. Cl.³ B05B *17/00*
U.S. Cl. 118—19 **6 Claims**



1. Apparatus for the uniform, fully enclosing surface coating of individual particles of pourable materials having nearly uniform particle size with either a smooth, rough or scabrous serrated surface, in a fluidizing fountain with heated air under use of an inorganic and or organic coating material in the form of a suspension or solution; a steep funnel-like upwardly enlarged container within which a predetermined quantity of the material is to be coated, said container having a shorter less steep funnel-like lower segment located at the bottom of said

upwards enlarged container; means for the injection of a heat air stream into said container at controlled velocity in ascending vertical direction to form a fluidized fountain of limited height and diameter incident to the middle axis and thereby forming a core zone; at least one nozzle for injecting the suspension or solution from below and in the same direction as the heat air, said nozzle being located at the lower end of the container for injecting the suspension or solution in an upward direction with a nozzle spray angle of between 30° and 60° at a predetermined mass/time ratio into the core stream of high volume concentration and for effecting the complete, uniform deposition of the suspension on the surface of the material, and simultaneous drying of the treated material during the ascent in the core zone and its descent within the peripheral at a reduced air stream pressure, sliding along the vessel wall into the funnel-shaped lower container segment towards the formed fluidizing fountain and repetition thereof until the predetermined coating quantity has been applied and drying of the surface-coated material to a prescribed moisture content, said steep funnel-like, upwardly enlarged container having a circular or polygonal configuration whose upper portion constitutes a body of increasing diameter wherein the diameter ratio of the upper part, measured from the bottom to the top is in a ratio of 1:1.5 to 1:4.5 and said shorter less steep funnel-like lower segment opens into said upper portion and has sides which form an angle relative to the perpendicular of 20 to 50; and the screen closures at the upper and lower end of said container consisting of exchangeable screens of maximum free area with a mesh size smaller than the smallest particle of the material to be coated.

4,425,866

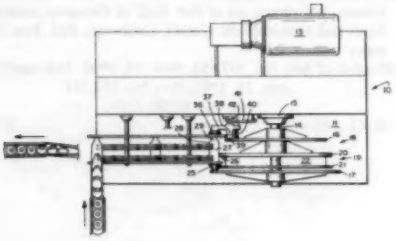
MACHINE AND METHOD FOR COATING PLASTIC CONTAINERS

Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Continuation-in-part of Ser. No. 306,483, Sep. 28, 1981, abandoned. This application Oct. 26, 1981, Ser. No. 315,003

Int. Cl.³ B05C *13/02*

U.S. Cl. 118—58 **10 Claims**



1. A machine for applying a liquid coating to cylindrical articles which comprises:

(a) a rotary shaft having an axis of rotation,

(b) a plurality of pairs of chucks supported radially outwardly of said shaft for rotation with said shaft in an orbital path about the axis of said shaft, the chucks of each pair being in axial alignment and being free to rotate about their individual axes parallel to the axis of said shaft, each such pair of chucks being adapted to pick up a cylindrical article at a pickup point, to transport each article to a delivery point and to release the article at such delivery point,

(c) chuck spinning means mounted on said shaft and free to rotate relatively thereto, said chuck spinning means engaging one of each pair of chucks as it rotates orbitally about the axis of said shaft to cause each such chuck to spin about its individual axis, said chuck spinning means also allowing reversal of the direction of spinning of the article,

(d) means for rotating said chuck spinning means relatively to said shaft, and

(e) applicator means in the form of a rotary member tangent to said cylindrical articles as they undergo orbital motion about the axis of said shaft.

4,425,867

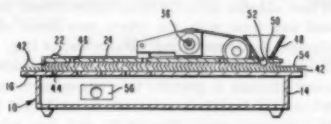
APPARATUS FOR APPLYING TONER

Herbert A. Tobias, East Brunswick, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 6, 1979, Ser. No. 64,396

Int. Cl.³ B05C *1/02, 19/00*

U.S. Cl. 118—120 **10 Claims**



1. Apparatus for applying toner to an image defining tacky surface on a photo-element, the apparatus comprising:

a support plate;

a toner distribution plate disposed in parallelism with the support plate with one of the plates being reciprocally movable with respect to the other, the distribution plate and the support plate cooperating to define a photo-element conveying path therebetween, the distribution plate having a toner distribution slot therein, the support plate and the distribution plate each having pile fibers depending therefrom, the fibers slanting from their respective plates and converging toward the other plate in the direction of conveyance of the photo-element along the conveying path,

a toner hopper adapted to receive a particulate toner therein mounted to the distribution plate and extending laterally thereacross, the hopper communicating with the toner distribution slot,

an applicator mounted for rotation within the distribution slot, the applicator having bristles emanating therefrom, the bristles extending into the photo-element conveying path and slanting in a direction opposite to the direction of slant of the pile fibers; and,

means attached to one of the plates for reciprocating it in a plane parallel to plane of the other plate, the relative motion between the plates and the fibers thereon imparting movement to the photo-element to convey it along the conveying path, the movement of the photo-element along the conveying path rotating the applicator to distribute toner from the hopper onto the photo-element.

4,425,868

COATING HOOD

Richard G. Shapiro, Elmira, N.Y., assignor to Thatcher Glass Corporation, Greenwich, Conn.

Filed Dec. 28, 1981, Ser. No. 335,086

Int. Cl.³ B05B *15/02*

U.S. Cl. 118—314 **1 Claim**

1. Hood apparatus for coating vitreous articles, comprising:

hood means comprising a top wall and a pair of side walls extending downwardly from said top wall to define a coating chamber;

means operative to convey vitreous articles along a predetermined path through said coating chamber;

a first pair of coating fluid spray means operative to direct a coating fluid toward said predetermined path;

one of said spray means being adjacent one side wall at a certain location along said conveying path;

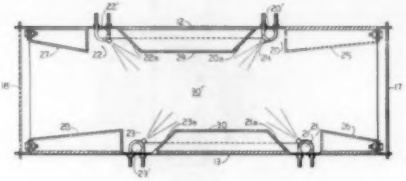
the other said spray means being adjacent the other side wall

and longitudinally offset from said first spray means relative to said predetermined path,

so that fluid from said pair of spray means impinges vitreous articles on said conveying means in longitudinally offset pattern so as to avoid fluid flow stagnation;

a second pair of coating fluid spray means operative to direct coating fluid toward said predetermined path;

one of the spray means of said second pair being at said one side wall and the other spray means of said second pair



being at the other side wall longitudinally offset from said one spray means of said second pair;

each said spray means comprising a fluid manifold disposed in a niche formed in the adjacent sidewall;

at least one spray aperture associated with the manifold to direct a coating fluid spray at a certain nonperpendicular angle toward said predetermined path; and

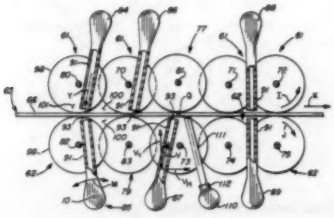
each said niche including a nonperpendicular wall portion permitting unimpeded fluid flow from the manifold associated with that niche.

4,425,869

FLUID FLOW CONTROL MECHANISM FOR CIRCUIT BOARD PROCESSING APPARATUS

J. Richard Hull, Chandler, Ariz., assignor to Advanced Systems Incorporated, Phoenix, Ariz.

Filed Sep. 7, 1982, Ser. No. 415,390
Int. Cl.³ B05C *5/02*
U.S. Cl. 118—314 **1 Claim**



1. Apparatus for directing a stream of fluid against a substrate panel traveling through said apparatus in a selected direction of travel, said panel having a pair of opposed generally parallel planar surfaces coterminating at the edge defining the periphery of said panel, said apparatus including

(a) a conveyor table for transporting said substrate panel in said direction of travel, said conveyor table including at least one rotary axle carrying a plurality of spaced circular rollers contacting said pliant substrate panel moving past said rollers;

(b) at least one fluid flow unit generating a pressurized stream of fluid and having an elongate plenum with a longitudinal axis transverse said direction of travel of said substrate, said elongate plenum including

(i) an upper portion,

(ii) a lower portion,

(iii) a plurality of spaced elongate slots passing transversely through said lower portion of said plenum with respect to said longitudinal axis, and

(iv) a mouth formed in said lower portion of said plenum, said pressurized stream of fluid passing through said mouth to leave said fluid flow unit,

each of said slots being shaped, contoured and dimensioned to continually receive and permit portions of one of said rotating circular rollers to pass therethrough such that

(v) the one of said portions of said roller positioned in and rotating through said slot at a particular time is able to move freely therein, and

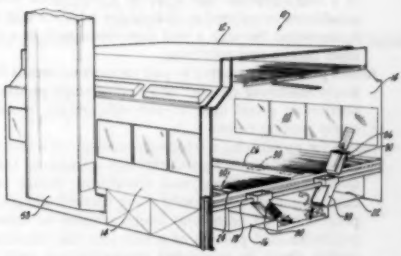
(vi) said mouth of said plenum is positioned generally adjacent said substrate panel as said panel moves into contact with said roller.

4,425,870

PAINT SPRAY BOOTH

Hugh E. Marshke, 7240 W. Cedarcroft, W. Bloomfield, Mich. 48033

Filed Mar. 29, 1982, Ser. No. 362,980
Int. Cl.³ B05B *15/00*
U.S. Cl. 118—326 **6 Claims**



1. A paint spray booth for spray painting articles comprising:

a housing having a bottom and a substantially horizontal floor spaced upwardly from the bottom, said floor forming an upper housing chamber and a lower housing chamber, the articles to be painted being positioned in said upper chamber,

means for supplying water to an upper surface of said floor,

air scrubber means open through said floor and fluidly connecting said housing chambers for intermixing water and air,

said air scrubber means comprising an elongated duct open at each end and forming an elongated air/water passageway between said housing chambers, at least one baffle panel, and means for removably securing said at least one baffle within said duct so that said at least one baffle panel lies in a plane substantially parallel to a longitudinal axis of said duct and so that said at least one baffle panel extends along substantially the entire length of said duct,

means for inducting an air/water mixture through said air scrubber means and into said lower chamber,

means contained within said lower chamber for collecting and removing water inducted into said lower chamber,

wherein the vertical spacing between said housing bottom and said housing floor is less than four and one half feet, and

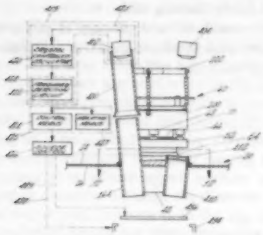
wherein said duct extends downwardly from said floor at an acute angle in the range of 50 degrees to 70 degrees.

4,425,871

APPARATUS FOR SENSING DEPOSITION OF A THIN FILM LAYER OF A MATERIAL

Richard T. Martin, Santa Barbara, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Continuation-in-part of Ser. No. 232,842, Feb. 9, 1981, Pat. No. 4,373,470. This application May 26, 1981, Ser. No. 267,038
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—664 **31 Claims**



1. Apparatus for sensing deposition of a thin film layer of a material from a source onto a substrate comprising

supporting means adapted to be positioned between a substrate and a source and including selectively passing means for enabling passage of selected predetermined portions of a said material from a said source along each of a plurality of predetermined paths located in the proximity of a said substrate and adjacent a deposition path under conditions correlated to that under which a said material is deposited through a said deposition path in a thin film layer onto a said substrate;

means positioned relative to said supporting means for selectively inhibiting passage of a said selected predetermined portion of a said material through certain of said selectively passing means;

means for monitoring a selected parameter of a said thin film material which is passed through certain of said selectively passing means, said monitoring means including detecting means positioned along each of said plurality of predetermined paths and being adapted to sense a said predetermined portion of a said thin film material being passed along its associated predetermined path and for producing electrical signals derived from the selected parameter of a thin film material so detected representing at least one of the mass per unit area, thickness and deposition rate of a said thin film of material; and

means operatively coupled to said supporting means for transporting the supporting means including the selectively passing means relative to a said substrate and source to selectively change certain of said selectively passing means while enabling a selected predetermined portion of a said material to pass through certain of the selectively passing means to said monitoring means.

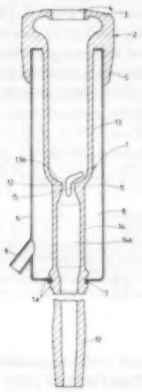
4,425,872

MILKING INFLATIONS

Geoffrey S. Mills, Walton Park, Walton, Waikato, New Zealand

Filed Jan. 21, 1982, Ser. No. 341,496
Int. Cl.³ A01J *5/06*
U.S. Cl. 119—14.47 **8 Claims**

1. In a teat cup milking inflation of the type sealingly engageable within a rigid teat cup shell and adapted to receive a teat through an inflation mouth at the upper end portion and to connect with a vacuum milk line at the lower end portion, said inflation including a resilient tubular body part responsive to applied fluctuations in pressure within said shell to alternately collapse and expand around said teat, the improvement comprising a tubular body portion divided into a collapsible upper barrel section and a collapsible lower barrel section by a waisted junction section resistant to collapse having a bore communicating the upper and lower barrel sections, said waisted junction section being sufficiently smaller in diameter



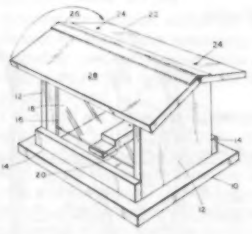
than said upper barrel section to function as at least a partial abutment for the distal portion of the teat to restrict upward crawl of the inflation.

4,425,873

BIRD FEEDER

Risto A. Rinne, Jr., 9 Town View Dr., New Milford, Conn. 06776

Filed Aug. 20, 1982, Ser. No. 409,840
Int. Cl.³ A01K *39/00*
U.S. Cl. 119—51 R **2 Claims**



1. A bird feeder comprising:

(a) a base plate having an upper surface;

(b) two panels attached to the upper surface of said base plate and disposed substantially perpendicularly thereto in spaced apart relationship, said panels forming opposite walls of the bird feeder; and

(c) a roof for partially enclosing an area between said panels and supported thereby comprising:

(i) a first roof section affixed to said panels,

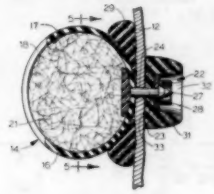
(ii) a second roof section in movable relationship with said first roof section, and

(iii) an elastomeric member connecting said first roof section to said second roof section, said elastomeric member being affixed to the top of at least a portion of both of said roof sections and extending along substantially the entire length of the interface formed therebetween for providing a flexible water protective seal and hinge,

whereby said second roof section can be displaced to facilitate

access to the area enclosed by said base plate, said panels and said roof.

4,425,874
DISPENSER
Francis W. Child, Southfork-Star Rte., Cody, Wyo. 82414
Filed Apr. 29, 1982, Ser. No. 372,988
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—156 **20 Claims**



1. An apparatus accommodating liquid insecticide adopted to be attached to the ear of an animal comprising:

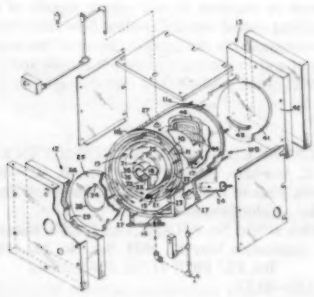
a body having a flexible wall surrounding a chamber,

means located in the chamber for retaining liquid insecticide,

said wall being made of material having a porosity that allows limited seepage of liquid insecticide to the atmosphere, said wall having at least one slit providing a normally closed mouth, said mouth being opened upon application of force to said wall whereby liquid insecticide can be introduced into said chamber, and

connector means operable to attach the body to an ear of the animal.

4,425,875
WOUND BOILER WITH REMOVABLE AND REPLACEABLE COMBUSTION CHAMBER
John D. Marran, Overleigh Rd., Bernardsville, N.J. 07924
Filed Dec. 30, 1981, Ser. No. 335,877
Int. Cl.³ F22B *11/00, 21/26*
U.S. Cl. 122—134 **9 Claims**



1. A combustion chamber and liner for use in a wound boiler having, a plurality of spaced heat exchanger convolutions forming a central space and combustion gas flow passages therein comprising;

a. an independent free standing sized, elongated, hollow cylindrical means having an inner wall means defining a fire box for combustion of fuel therein,

b. said hollow cylindrical means made from an insulating material having a relatively low coefficient of thermal conductivity and capable of withstanding the relatively high temperatures of the gaseous products of combustion generated in the fire box,

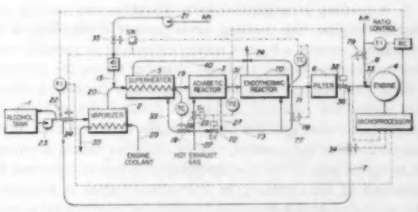
c. said hollow cylindrical means having, a charging inlet for fuel, and a discharge outlet in the wall means a spaced distance remote from the charging inlet,

d. an arcuate extension and guide projecting from the cylindrical means at a point adjacent the discharge outlet to guide and turn the flow of combustion gases expanding from the fire box and to direct the same along the extension of the cylindrical means in an axial direction counter to the direction of flow of the combustion gases in the fire box,

e. means defining a front shoulder about the charging inlet end of the hollow cylindrical means, and

f. key means on said front shoulder for fixing and orienting the position of the cylindrical means in the wound boiler so that the discharge outlet is aligned and disposed to deliver combustion gases from the fire box to said combustion gas flow passages.

4,425,876
ALCOHOL DISSOCIATION AND WASTE HEAT RECOVERY PROCESS FOR AUTOMOBILES
Gerald D. Rutledge, and Heeyoung Yoon, both of McMurray, Pa., assignors to Conoco Inc., Wilmington, Del.
Filed Sep. 3, 1982, Ser. No. 414,984
Int. Cl.³ F02M *27/02*
U.S. Cl. 123—3 **3 Claims**



1. A method of fuel treatment and distribution for an automobile internal combustion engine comprising the steps as follows:

(a) operating an adiabatic reactor without a substantial amount of exhaust heat within an operational temperature range said catalyst bed reactor comprising a partial combustion catalyst and a dissociation catalyst;

(b) providing a substantial amount of engine exhaust heat to an endothermic reactor having an endothermic dissociation catalyst therein,

(c) vaporizing liquid alcohol to form alcohol vapor;

(d) mixing said alcohol vapor with air to form a partial combustion mixture;

(e) contacting said partial combustion mixture and said partial combustion catalyst whereby a dissociation mixture is formed and heat is evolved;

(f) contacting said dissociation mixture and said dissociation catalyst to form a hydrogen-rich fuel;

(g) contacting said hydrogen-rich fuel and said endothermic dissociation catalyst to form a fuel product whereby at least a portion of any residual undissociated alcohol in said hydrogen-rich fuel is dissociated to hydrogen and carbon monoxide using the engine waste heat provided by the exhaust gas.

4,425,877

COOLING ARRANGEMENT FOR LIQUID COOLED INTERNAL COMBUSTION ENGINES

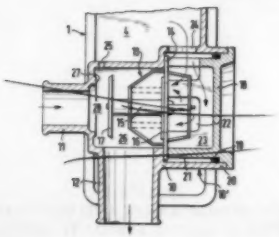
Josef A. Fritzenwenger, Anzing; Martin Probst, and Gunther Schmid, both of Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,145

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112202

Int. Cl.³ F01P 7/16

U.S. Cl. 123—41.1 11 Claims



1. A cooling arrangement for a liquid cooled internal combustion engine, the cooling arrangement comprising a heat exchanger means, a bypass means extending in parallel to said heat exchanger means, a mixing chamber means for accommodating a cooled and uncooled portion of a coolant, a thermostat means for radiating a flow of coolant through the heat exchanger means and the bypass means in dependence upon a temperature of the coolant, mixing chamber means is arranged at an outlet side of the heat exchanger means in a normal flow direction of the coolant, the thermostat means is arranged in the mixing chamber means and is adapted to selectively control at least one inlet opening into the mixing chamber means such that the mixing chamber means is connected ultimately with the heat exchanger means and the bypass means and characterized in that

the thermostat means further includes a coolant entrance chamber means defined in the housing, the coolant entrance chamber means is adapted to be brought into communication with the mixing chamber means by the thermostat means, the entrance chamber means, mixing chamber means, and bypass means are formed by a plurality of cylindrical sections having decreasing diameters, a longitudinal center axis of each of the cylindrical sections forming the entrance chamber means, mixing chamber means, and bypass means are coincidental and extend substantially parallel to an air flow direction through the cooling area and at a position spaced from an outside of an extension of an outside wall of the return flow coolant tank means, the entrance chamber means is defined by the housing means and the cover means, the entrance chamber means and the cover means are arranged on the front side whereas the bypass means are arranged on the back side of the return flow coolant tank means as viewed in a flow direction of the coolant and in that the discharge opening of the mixing chamber means is arranged on an outside wall of the return flow coolant tank means.

4,425,878

INTERNAL COMBUSTION ENGINE COOLING METHOD AND DEVICE

Olof Samuel, Saltsjö-Boo, Sweden, assignor to Nordstjernan AB, Stockholm, Sweden

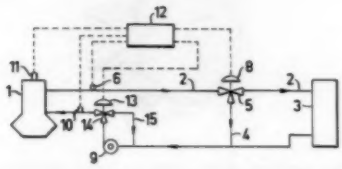
PCT No. PCT/SE81/00215, § 371 Date Feb. 25, 1982, § 102(e) Date Feb. 25, 1982, PCT Pub. No. WO82/00317, PCT Pub. Date Feb. 4, 1982

PCT Filed Jul. 10, 1981, Ser. No. 359,662

Claims priority, application Sweden, Jul. 10, 1980, 8005086

Int. Cl.³ F01P 5/10, 7/14

U.S. Cl. 123—41.08 11 Claims



1. A method for cooling internal combustion engines for reducing corrosive wear of cylinder barrels and piston rings, comprising maintaining the surface temperature for cylinder barrels and piston rings below the lower temperature limit for maximum corrosion due to the SO_3-content in the flue gas by controlling the cooling effect while the engine is subjected to a load up a predetermined partial load, at increasing engine output and when said partial load has been arrived at adjusting the cooling effect so that the surface temperature is increased abruptly to a value above the upper limit of temperature for said maximum corrosion, and maintaining the surface temperature thereafter above said value.

6. A device for controlling the cooling of internal combustion engines having a closed circuit cooling system including a radiator and a pump in order to reduce corrosive wear of cylinder barrels and piston rings by controlling their surface temperature comprising a control unit, a transducer operably mounted on the engine to produce signals corresponding to the engine output and operably connected to said control unit to transmit said signals as input signals to said control unit, said control unit in response to said output signals of said transducer emitting output signals, coolant flow rate control means operably connected in the coolant circuit of the engine and to said control unit to receive said output signals and in response thereto control the coolant flow rate through the engine.

4,425,879

INTERNAL COMBUSTION ENGINE FAN DRIVE

Michael C. Shadday, Edinburg, and Dennis A. Wilber, Elizabethtown, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

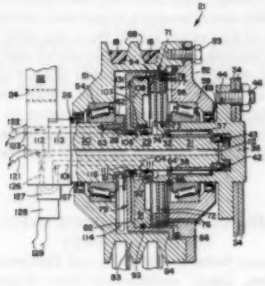
Continuation of Ser. No. 931,436, Aug. 7, 1978, abandoned. This application May 11, 1981, Ser. No. 262,614

Int. Cl.³ F01P 11/10; F16D 33/12

U.S. Cl. 123—41.12 14 Claims

1. A fan drive for an internal combustion engine including a fan and an engine drive, said fan drive comprising a clutch which when engaged couples said engine drive to said fan and when disengaged uncouples said engine drive from said fan, said clutch including at least two parts forming a pressure chamber, at least one of said two parts being rotatable, feed and return liquid passage means connected to said chamber and adapted to be connected to a source of liquid under pressure, first valve means connected in said feed passage means for controlling the communication of liquid pressure between the source and said pressure chamber, said first valve means having an open position where said pressure chamber receives substantially the full pressure of said source and a closed position where said passage means is closed and pressure is locked

in said chamber, and second valve means on said rotatable part for releasing pressure in said chamber to said return passage after said first valve means is moved to said closed position, said clutch being actuated when said first valve means is open and liquid pressure appears in said chamber, said second valve means including a member that responds to centrifugal force



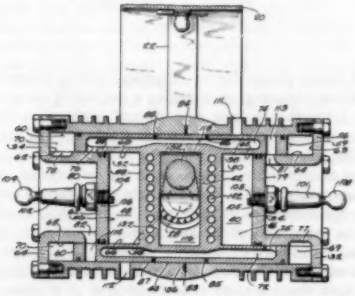
and to liquid pressure and having a closed position and an open position, and said pressure chamber being bounded by seals which enable leakage of liquid under pressure from said chamber when said first valve and said second valve are in said closed positions, and said seals leaking said liquid under pressure when said first valve is closed and thereby causing said second valve to open and sald clutch to slowly disengage.

4,425,880

ROTATING CYLINDER INTERNAL COMBUSTION ENGINE

Bertram J. Rochlus, 5730 N. 96th St., Milwaukee, Wis. 53225

Filed Jul. 16, 1981, Ser. No. 283,854
Int. Cl.³ F02B 57/06
U.S. Cl. 123—44 C **23 Claims**



1. An improved internal combustion engine to rotate an output shaft, comprising:

A. a stationary frame member;

B. a cylinder housing mounted to said frame member for rotation about a rotary axis and having first and second ends and a cylindrical inner wall defining an interior space; and wall means defining recessed cylinder heads surrounded by annular spaces;

C. a double-ended piston having a continuous outer wall, H-shaped in cross-section, being captured in said space for rectilinear motion and having first and second recessed working faces respectively opposed to said first and second ends to define first and second combustion chambers in said space; the projecting legs of said H-shaped piston being reciprocatable into said annular spaces surrounding said cylinder heads;

D. transfer means to introduce, a combustible fuel mixture alternately in said first and second combustion chambers, whereby to reciprocate said piston rectilinearly in said space, said fuel transfer means including fuel injection means in the form of fuel inlets in said cylinder housing, wall means defining an annular and generally cylindrical fuel transfer passage located inside of said piston outer wall, fuel injection inlets in said housing wall for communication with said annular transfer passage at a selected timed sequence; an air inlet port in said cylinder wall opposite said annular spaces surrounding said cylinder heads, said piston legs controlling said air inlet ports and affording communication of outside air with said transfer passage for mixing with said fuel;

E. first power transmission means coupled to said piston to transmit the rectilinear motion of said piston to said housing to rotate said housing, said means including a piston slot transverse to the longitudinal axis of said piston, a stationary unitary crankshaft having an axis coincident with said housing rotating axis, an offset crank on said crankshaft, a rectangular block having an aperture for receiving said crank, said block being reciprocatable in said slot to afford piston movement relative to said housing during housing movement; and

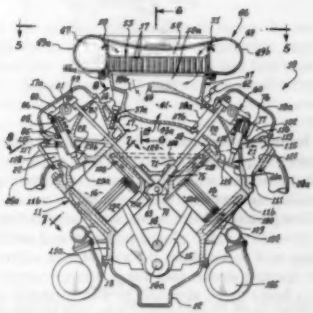
F. second power transmission means coupled to said housing to transmit the rotation of said housing to said output shaft to rotate said shaft.

4,425,881

RECIPROCATING ENGINE AIR INTAKE SYSTEM

Francis R. Lyndhurst, Costa Mesa, Calif., assignor to Aero Power Engine Manufacturing, Inc., Incline Village, Nev.

Filed Oct. 2, 1981, Ser. No. 307,855
Int. Cl.³ F02B 75/22
U.S. Cl. 123—52 MV **17 Claims**



4. In an internal combustion engine having air intake manifolding proximate two parallel cylinder heads, the heads extending longitudinally and being laterally spaced, the improvement combination comprising

(a) said manifolding including runner ducts that extend generally laterally and in generally parallel relation,

(b) each runner duct having a discharge end communicating with intake valve porting associated with one of said heads,

(c) each runner duct having an intake end spaced generally laterally from its discharge end, said intake ends extending in two laterally spaced parallel rows that extend longitudinally,

(d) and a plenum chamber communicating with said intake ends and via which air is supplied to both of said rows of runner duct intake ports, said intake ends opening gener-

ally upwardly, and said plenum chamber being located above the runner ducts,

(e) said runner ducts being formed by a single metallic intake body supported to have said runner ducts extending generally between said two heads,

(f) said plenum chamber having two endwise longitudinally extending laterally spaced header zones to receive endwise longitudinal flow of compressed intake air, said header zones opening laterally along the lengths of said zones toward the upper interior of said plenum chamber via which intake air is supplied downwardly to said intake ends of the runner ducts,

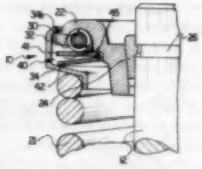
(g) said plenum chamber having an upper wall that extends convexly downwardly and laterally generally between said header zones and toward the uppermost mid-portion of said chamber, thereby to deflect the entering air downwardly toward said intake ends of the runner ducts, and including air cooling means in said plenum chamber below said upper wall in the path of air flow to said intake ends of the runner ducts, said air cooling means comprising a heat exchanger that extends longitudinally and laterally directly above the intake ends of all of said runner ducts, said intake ends facing upwardly toward the underside of said heat exchanger.

4,425,882

VALVE ROTATING DEVICE

Stanley H. Updike, Painesville; William A. Michaels, Seven Hills, and Frederick L. Kuonen, Mentor, all of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Dec. 10, 1980, Ser. No. 214,800
Int. Cl.³ F01L *1/32*
U.S. Cl. 123—90.3 **7 Claims**



1. In an internal combustion engine, a valve reciprocable between an open position and a closed position, a valve seat in a cylinder head, a valve spring, said valve having a valve body for seating against said valve seat in the valve closed position and a longitudinal valve stem, said valve spring acting to bias said valve to a valve closed position, and a valve rotator for rotating said valve about the axis of said valve stem during a valve opening stroke, said valve rotator comprising:

(a) a body to be attached to and rotatable with the valve stem, said body having at least one groove therein extending at least partially around said valve stem;

(b) at least one coil spring element longitudinally disposed within said groove;

(c) a collar for receiving the valve spring biasing force and encircling said valve stem adjacent said body, said body and said collar being movable in axial and rotational directions relative to each other;

(d) a pair of spring washers encircling said valve stem and interposed between said collar and said coil spring element;

(1) one of said spring washers side loading the coils of said coil spring element when the valve is closed and having a portion bearing on said body when the valve is closed,

(2) the other of said spring washers acting between said collar and said portion of said one spring washer and having a first portion which overlies said portion of said one spring washer bearing on said body when the valve is closed and a second portion spaced from said one spring washer when the valve is closed,

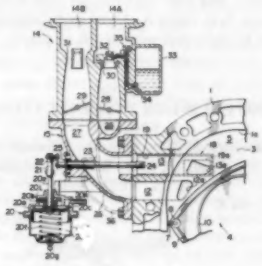
(3) each of said spring washers having an inner circumference and an outer circumference, said overlying portions of said one and said other spring washers cooperating with each other adjacent the inner circumferences thereof to transmit surges of the valve spring from said collar through said overlying portions of said one and said other spring washers to said body to thereby isolate surges of the valve spring from the coils of said coil spring element, said second portion of said other spring washer engaging said one spring washer adjacent their outer circumference when the valve spring biasing force exceeds a predetermined amount to transmit the valve spring biasing force to said coil spring element to thereby effect rotation of said body and the valve stem.

4,425,883

INTAKE MEANS FOR TWO-ROTOR TYPE ROTARY PISTON ENGINES

Tomoo Tadokoro; Nobuhiro Hayama, and Toshimichi Akagi, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jul. 15, 1981, Ser. No. 283,685
Claims priority, application Japan, Jul. 16, 1980, 55-97863
Int. Cl.³ F02B *53/06*
U.S. Cl. 123—242 **6 Claims**



1. A rotary piston engine including a casing comprised of a pair of rotor housings each having a trochoidal inner wall and secured together at one side thereof with an intermediate housing disposed therebetween and a side housing secured to the other side of each rotor housing to define a rotor cavity in each of the rotor housings between the intermediate and side housings, a substantially polygonal rotor disposed in each rotor cavity for rotation with apex portions in sliding engagement with the inner wall of the associated rotor housing to define working chambers of variable volumes to conduct intake, compression, combustion, expansion and exhaust strokes, exhaust port means formed in said casing so as to open to each rotor cavity at the working chamber in the exhaust stroke, primary intake port means formed in said intermediate housing so as to open to each rotor cavity at the working chamber in the intake stroke, said primary intake port means being located so that it is opened to the working chamber after the same working chamber is substantially disconnected from the exhaust port means, secondary intake port means formed in each side housing so as to open to each rotor cavity at the working chamber in the intake stroke, said secondary intake port means being located so that it is opened to and disconnected from the working chamber substantially simultaneously with the primary intake port means, auxiliary intake port means formed in each side housing so as to open through at least one opening to each rotor cavity at the working chamber in the intake stroke and located so that it is disconnected from the same working chamber later than the primary and secondary intake port

means, said auxiliary intake port means being provided with control valve means which is located adjacent the opening of the auxiliary intake port means and which closes the auxiliary intake port means under a predetermined engine load condition, and intake passage means having throttle valve means and connected with said primary, secondary and auxiliary intake port means.

4,425,884

CATALYTIC COMBUSTION ENGINES

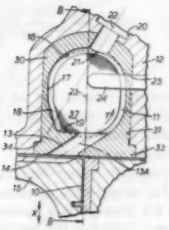
Robert H. Thring, Steyning, and Terence Hollis, Worthing, both of England, assignors to Ricardo Consulting Engineers plc, England

Filed Apr. 1, 1982, Ser. No. 364,306

Claims priority, application United Kingdom, Apr. 2, 1981, 8110389

Int. Cl.³ F02B *19/08*

U.S. Cl. 123—272 **18 Claims**



1. A reciprocating-piston air-compressing internal combustion engine with catalytic ignition, having at least one cylinder, a reciprocating piston in the cylinder, a cylinder head defining with the piston a main combustion space in the cylinder, into which space air for combustion with fuel is directly admitted, and a pre-combustion chamber in the cylinder head, a transfer passage interconnecting the pre-combustion chamber and the said main combustion space, said transfer passage having a longitudinal axis and having a mouth opening into the pre-combustion chamber and being so disposed as to promote swirl in the air forced through the transfer passage into the pre-combustion chamber during each compression stroke of the piston, the said swirling air circulating in a circumferential swirl path around the interior of the pre-combustion chamber, injector means having a nozzle for injecting a spray of liquid fuel into the pre-combustion chamber shortly before piston top-dead-centre, and a catalytic element mounted in the pre-combustion chamber and adapted to initiate and promote combustion of fuel/air mixture compressed in the pre-combustion chamber at about top-dead-centre, the said catalytic element comprising a foraminous catalytic screen member with a surface of catalytic material mounted to enclose a segment of the interior of the pre-combustion chamber and lying on one and the same side of both the mouth of the transfer and the nozzle of the injector means, in a position substantially to one side of and clear of the said circumferent swirl path of the circulating air.

4,425,885

DIESEL ENGINE FUEL INJECTION DEVICE

Toshiaki Tanaka, Fujisawa, and Shoji Ushimura, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 17, 1981, Ser. No. 284,466

Claims priority, application Japan, Jul. 18, 1980, 55-100685[U]

Int. Cl.³ F02M *45/02*

U.S. Cl. 123—299 **10 Claims**

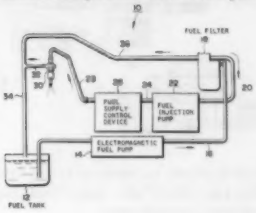
1. A fuel supply control device for use with a fuel injection pump of a diesel engine, comprising:

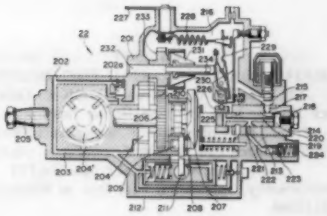
(a) means defining a first fuel passageway and a first bore intersecting said first passageway;

(b) a first piston member slidably disposed within the first bore, said piston having second and third fuel passageways;

(c) means biasing the piston member in a first direction to permit alignment of said first and second passageways with each other to allow fuel flow therethrough when fuel pressure is lower than a predetermined value; and

(d) a fourth passageway for admitting fuel from said first fuel passageway to one end of the piston member within the first bore to enable fuel pressure in said first passageway to





act against the piston-biasing means to move the second passageway via piston movement in a direction opposite the first direction out of alignment with said first passageway as fuel pressure increases through a predetermined range to thereby block fuel flow through the the second passageway and to enable the third passageway to move into alignment with said first passageway to permit fuel flow therethrough, said first piston being movable in the first direction to realign the first and second passageways as fuel pressure decreases from its highest value, whereby fuel flow through said device is varied as a function of fuel pressure in the first passageway.

4,425,886

ELECTRONIC CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Hiroshi Kuroiwa, Hitachi, and Yoshishige Oyama, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 31, 1980, Ser. No. 202,693

Claims priority, application Japan, Nov. 2, 1979, 54-141247

Int. Cl.³ F02D *33/00*

U.S. Cl. 123—339 **19 Claims**

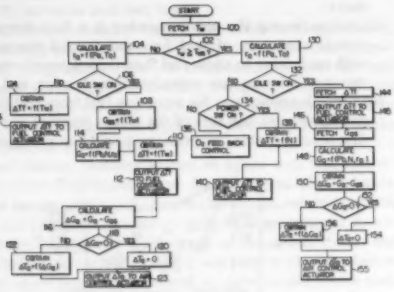
1. A method of controlling the air/fuel ratio of the air/fuel mixture supplied to an internal combustion engine comprising the steps of:

(a) measuring the actual mass air flow rate of the intake air flow to said engine;

(b) measuring at least one prescribed parameter representative of an operating condition of the engine;

(c) determining a desired mass air flow rate in accordance with the value of said at least one parameter measured in step (b); and

(d) controlling the actual mass air flow rate of the intake air flow rate to said engine in accordance with the desired mass air flow rate determined in step (c), so that the actual



mass air flow rate is caused to finally coincide with a mass air flow rate which has a prescribed relationship with the desired mass air flow rate.

4,425,887

APPARATUS FOR REGULATING THE IDLING RPM OF AN INTERNAL COMBUSTION ENGINE

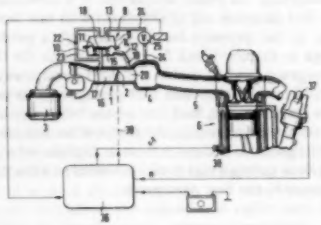
Heinrich Knapp, Leonberg, and Rainer Schillinger, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 364,112

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3113986

Int. Cl.³ F02M *7/12*

U.S. Cl. 123—339 **6 Claims**



1. An apparatus for regulating the idling rpm of an internal combustion engine having an intake tube in which an arbitrarily actuatable throttle valve is disposed, a bypass valve triggerable in accordance with operating characteristics of said engine associated with said intake tube, said bypass valve having a movable wall which at least defines a control chamber in which a control pressure prevails, said control pressure being capable of being influenced by an electromagnetically actuatable control valve, characterized in that said bypass valve further included a fixed valve seat engaging a supporting spring beneath said movable wall opposite said control chamber and communicating with the intake tube pressure downstream of said throttle valve, a first control throttle restriction in said control chamber communicating with atmospheric pressure and a second control throttle restriction in said control chamber communicating with said control valve and the intake tube pressure downstream of said throttle valve.

4,425,888

RPM-GOVERNING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH AUTO-IGNITION

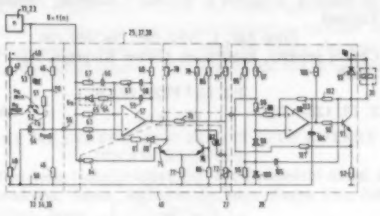
Gerhard Engel, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,756

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130080

Int. Cl.³ B60K *31/00;* **F02D** *5/04, 9/02;* **F02B** *3/00*

U.S. Cl. 123—339 **9 Claims**



1. An rpm-governing system for an internal combustion engine with auto-ignition, comprising:

an actual rpm value generator;

a set-point rpm value generator;

actual rpm/set-point rpm value deviation generating means connected to the actual rpm generator and the set-point rpm generator for generating a deviation signal representing the difference between the actual rpm value and the set-point rpm value at any given time;

an electromagnetic final control element influencing the quantity of fuel to be injected, at least during idling; and

a regulator connected to the final control element and the actual rpm/set-point rpm value deviation generating means for forming a trigger signal for the final control element in accordance with the deviation signal, said regulator having, preferably, PID behavior, wherein:

(i) the set-point rpm value generator is connected to the actual rpm value generator and detects when a predetermined minimum difference occurs between the actual rpm value and the set-point rpm value; and

(ii) the set-point rpm value generator generates an increasing set-point value once said predetermined minimum difference occurs, said increasing set-point value being less than the actual rpm value by the amount of the minimum difference.

4,425,889

ELECTRIC GOVERNOR FOR INTERNAL COMBUSTION ENGINE

Shuji Hachitani, Anjo; Yasushi Tanaka; Haruhiko Ogiso, both of Kariya, and Tetsuya Nakamura, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 6, 1982, Ser. No. 366,085

Claims priority, application Japan, Apr. 10, 1981, 56-54508

Int. Cl.³ F02M *59/00*

U.S. Cl. 123—357 **6 Claims**

1. An electric governor for a fuel injection pump of an internal combustion engine, comprising:

an actuator for regulating the fuel injection amount of said injection pump;

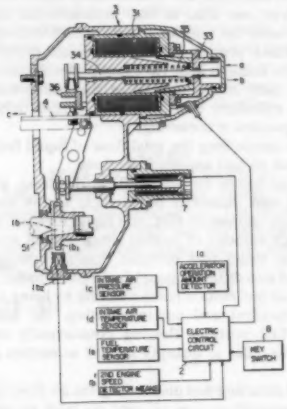
means for detecting operating conditions of the engine and generating signals representative of the operating conditions, said means including at least two engine speed detector means each for generating an engine speed indication signal changing in accordance with the engine speed;

electronic control means for selecting one of said detector means to check whether the selected means is normally operating and to select the speed indication signal of the

selected one detector when it is normally operating, otherwise selecting to check another one of said detector means to select the speed indication signal of the same that is normally operating, and determining a target fuel injection amount in accordance with said operating condition indication signal and said selected engine speed indication signal; and

means for controlling said actuator in accordance with said determined target fuel injection amount,

wherein said electronic control means includes microcomputer means for checking to see at regular time intervals



whether said engine speed indication signal is generated in predetermined normal cycles,

said microcomputer means generating an abnormality signal if said engine speed indication signal is not generated in the predetermined normal cycles, and

signal switching means for connecting one of said engine speed detector means to said microcomputer means,

said signal switching means connecting another engine speed detector means to said microcomputer means instead of said one of said engine speed detector means upon generation of said abnormality signal.

4,425,890

SPARK TIMING CONTROL APPARATUS FOR USE WITH A INTERNAL COMBUSTION ENGINE

Hiroshi Yamaguchi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 29, 1981, Ser. No. 306,852

Claims priority, application Japan, Sep. 29, 1980, 55-134273

Int. Cl.³ F02D *37/02*

U.S. Cl. 123—418 **34 Claims**

1. A spark timing control apparatus for use with a spark ignition of a fuel injected internal combustion engine, comprising:

a throttle valve for controlling intake air flow into the engine;

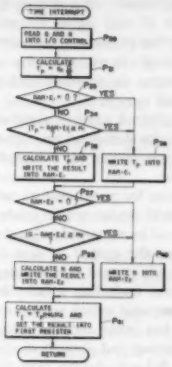
means for detecting if the throttle valve is closed;

means for sensing engine speed and for outputting a first parameter indicative of the sensed engine speed;

means for calculating a fuel injection amount using the first parameter and at least a second operational parameter and operable to output a third parameter indicative of the fuel injection amount;

means for smoothing at least one of the first and third parameters;

means, operative when said throttle valve is not closed, for determining spark timing using said first and third parameters, where at least one of said first and third parameters has been smoothed by the smoothing means;



said determining means being further operable, when the throttle valve is not closed to select which of said first and third parameters should be smoothed and used.

4,425,891

ENGINE KNOCK CONTROL APPARATUS

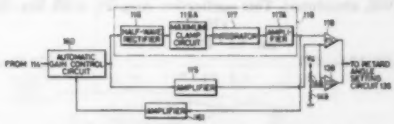
Yuichi Kashimura, Katsuta; Seiji Suda, Mito, and Noboru Sugiura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,651

Claims priority, application Japan, Aug. 14, 1980, 55-110999

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—425 **10 Claims**



1. An engine knock control apparatus comprising:

a knock sensor for detecting an engine knock signal;

an automatic gain control circuit coupled to receive and amplify a knock detection signal from said knock sensor;

an integrating circuit coupled to receive an output signal from said automatic gain control circuit to provide an integrated output signal;

means for coupling said integrated output signal to a control input of said automatic gain control circuit to control the amplification of said knock detection signal in accordance with the level of said integrated output signal; and

a comparator coupled to receive and compare said integrated output signal and the output signal from said automatic gain control circuit to provide a spark timing control signal to an ignition control device based on said comparison of said integrated output signal and the output signal from said automatic gain control circuit.

3. In an engine control apparatus including a knock sensor for detecting an engine knock signal;

a first integrating circuit for integrating the output of said knock sensor;

a comparator for producing an output for controlling an ignition control device which controls the spark timing of an ignition coil by means of a signal obtained by the output thereof when the output of said knock sensor becomes greater than the output of said integrating circuit;

the improvement including a knock signal clamping circuit which is disposed between the input of the integrator and the output of said knock sensor and clamps the output signal of said sensor in a setting wave height when the wave height of said signal becomes above said setting wave height for preventing abnormal rise of a voltage of said integrating circuit, whereby said comparator compares the output signal from said integrating circuit and that from said sensor.

9. In an engine knock control apparatus including:

a knock sensor for detecting an engine knock signal;

a first integrating circuit for integrating the output of said knock sensor;

comparing means for producing an output for controlling an ignition control device which controls the spark timing of an ignition coil by means of a signal obtained by the output thereof when the output of said knock sensor becomes greater than the output of said integrating circuit;

the improvement including a fail-safe device which is disposed between said knock sensor and said ignition control device, and has upper and lower limit setting voltages for detecting normal and abnormal conditions of said knock sensor, said fail-safe device detecting a normal condition when a detecting voltage of said knock sensor is within the range of said setting voltages, detecting an abnormal condition and retarding the angle of the spark timing of said ignition coil to a predetermined value by the output thereof when a detected voltage is out of the range of said setting voltages.

4,425,892

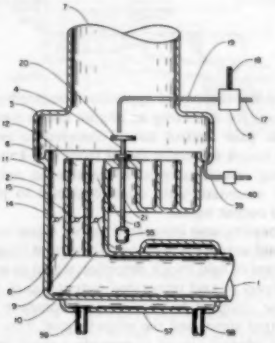
FURTHER IMPROVED ENGINE INTAKE STRATIFIER FOR CONTINUOUSLY VARIABLE STRATIFIED MIXTURES

Joseph C. Firey, P.O. Box 254, Northgate Sta., Seattle, Wash. 98125

Continuation-in-part of Ser. No. 69,609, Aug. 24, 1979, abandoned, and a continuation-in-part of Ser. No. 165,233, Aug. 2, 1980, abandoned. This application Aug. 15, 1980, Ser. No. 178,610

Int. Cl.³ F02B *17/00*

U.S. Cl. 123—430 **23 Claims**



1. An internal combustion engine, utilizing continuously variable stratified air fuel vapor mixtures at intake, comprising:

an internal combustion engine mechanism comprising;

at least one engine cylinder with at least one piston operative within each of said cylinders;

each of said engine cylinders comprising an intake pipe;

means for timing the separate cycles of said engine cylinders relative to each other;

at least one fuel tank;

at least one enclosed vaporizer section comprising;

an air inlet;

at least one liquid fuel inlet;

an air fuel vapor mixture outlet;

means for connecting said air fuel mixture outlet of each of said vaporizer sections to the intake pipes of a group of engine cylinders so that, said group of engine cylinders comprises at least one of said engine cylinders, each of said intake pipes of said engine cylinders is connected to said air fuel mixture outlet of at least one vaporizer section;

means for delivering liquid fuel into each of said vaporizer sections, via said liquid fuel inlets, so that; at least one kind of fuel is delivered; the instantaneous liquid fuel flow rate of at least one kind of fuel increases and decreases in pulses, with the number of said pulses occurring during each intake process of the connected group of engine cylinders being at least two, said pulses occurring equally during each intake process of the connected group of engine cylinders; fuel flow rate is zero only when no intake process is occurring;

means for controlling the total flow of liquid fuel delivered into each of said vaporizer sections;

at least one means for accelerating, directing, and proportioning said delivered liquid fuels within each of said vaporizer sections so that, said liquid fuels are accelerated to a high velocity of motion along several motion paths, different liquid fuel portions flowing concurrently are directed into different liquid fuel motion paths, said different liquid fuel motion paths differing by being at least both non-coincident and non-intersecting, the said different liquid fuel portions flowing concurrently are proportioned to differ in quantity as well as motion path direction;

means for directing and distributing the air flowing into each said vaporizer section via said air inlet so that, said air flows across the high velocity motion paths of the liquid fuel, and so that each air portion flows closely adjacent at least one fuel portion and each fuel portion flows closely adjacent at least one air portion within said vaporizer section.

4,425,893

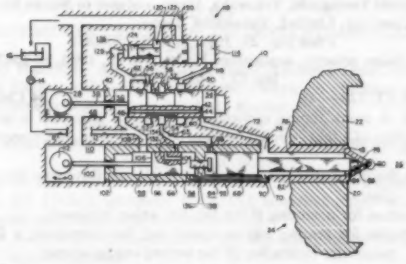
FUEL INJECTION

Robert W. McJones, Palos Verdes, Calif.; Robert S. McCarty, Phoenix, Ariz., and Joseph S. Cardillo, Palos Verdes Est., Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 7, 1981, Ser. No. 327,827

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—446 **40 Claims**



1. The method of injecting fuel into an internal combustion engine comprising the steps of:

increasing the pressure of said fuel to a determined pressure level;

measuring a certain quantity of said pressurized fuel;

delivering to said internal combustion engine said measured certain quantity of pressurized fuel while maintaining the

pressure level thereof substantially at said determined pressure level;

expanding and contracting a variable-volume chamber in timed relation to said internal combustion engine to respectively measure said certain quantity of pressurized fuel and to deliver said measured certain quantity of fuel to said internal combustion engine;

reciprocating a pressure-responsive piston member in timed relation to said internal combustion engine to expand and contract said variable-volume chamber;

using said pressure-responsive piston member to open a passage communicating said variable-volume chamber with a source of comparatively low pressure relative to said determined pressure level; and

forming abutment means cooperating with said pressure-responsive piston member and with said pressure-responsive plunger member to shift the latter to close said fuel flow path upon a predetermined movement of the former contracting said variable-volume chamber.

4,425,894

FUEL INJECTING DEVICE

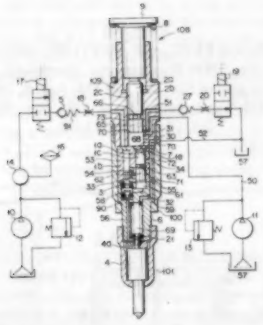
Masaaki Kato, Toyoake, and Tetsuji Akashi, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 22, 1982, Ser. No. 421,496

Claims priority, application Japan, Sep. 25, 1981, 56-152358; Oct. 2, 1981, 56-157899

Int. Cl.³ F02M *57/02*

U.S. Cl. 123—446 **13 Claims**



1. A fuel injecting device comprising:

(I) A fuel injector including:

(a) a housing having first and second bores,

(b) a delivery plynger inserted in said first bore for reciprocation and driven by an engine in synchronism therewith,

(c) a delivery pump chamber defined between said first bore and said delivery plunger,

(d) an injection plunger inserted in said second bore for reciprocation,

(e) an injection pump chamber defined between said second bore and one end of said injection plunger,

(f) a pressure chamber defined between said second bore and the other end of said injection plunger and communicating with said delivery pump chamber,

(g) an injection nozzle connecting with said injection pump chamber,

(h) a feed port formed in said housing and operatively opening into said delivery pump chamber, for conducting fuel into said delivery pump chamber,

(i) a timing port formed in said housing and operatively opening into said delivery pump chamber, said timing port being so located that said timing port is closed by said delivery plunger after said feed port is closed by said delivery plunger, and that the latest injection timing is determined when said timing port is closed by said delivery plunger during injection at the latest injection timing,

(J) a spill port formed in said housing and connecting with said injection pump chamber for determining the injection termination,

(k) a drain port formed in said housing and connecting with said pressure chamber at the latest immediately after said injection termination,

(l) a metering passage connecting with said injection pump chamber for supplying fuel thereto, and

(m) a check valve is said metering passage for preventing the fuel supplied to said injection pump chamber from flowing backward;

(II) a fuel tank;

(III) a pump for raising the pressure of fuel from said fuel tanks to a predetermined level;

(IV) metering means connecting said pump with said metering passage for metering the fuel supplied to said injection pump chamber;

(V) timing control means connecting with said timing port through a timing passage, for controlling the starting time of the fuel injection by closing said timing passage;

(VI) an orifice formed in said timing passage; and

(VII) means connecting with said feed port for supplying fuel from said fuel tank to said delivery pump chamber when said delivery plunger is raised.

4,425,895

AIR-FUEL RATIO FEEDBACK CONTROL SYSTEM

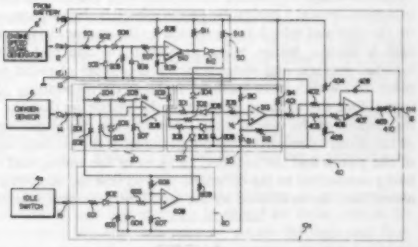
Shuzo Yoshida, Anjo; Hironobu Ono, Toyota; Masashi Matsuo, Toyota; Kouich Hoshi, Toyota; Motoharu Sueishi, Toyota, and Kazuo Ueda, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 21, 1981, Ser. No. 294,823

Claims priority, application Japan, Sep. 3, 1980, 55-122755

Int. Cl.³ F02D *5/00*

U.S. Cl. 123—489 **7 Claims**



1. An air-fuel ratio feedback control system for an internal combustion engine comprising:

an idle switch for detecting closed state of a throttle valve of the engine;

an oxygen sensor for detecting the oxygen concentration in the exhaust gas;

comparator circuit means for generating a comparison signal related to a comparison of the detection output of said oxygen sensor with a predetermined value;

signal delay means for delaying said comparison signal;

control signal generator means for integrating the output of said delay means and producing a command signal for controlling the amount of fuel supply;

idle-off timer means for detecting the turning on of said idle switch and a predetermined time after the turning off of said idle switch;

engine speed discriminating circuit means for discriminating whether the engine speed is included in a predetermined rotational speed region; and

delay-time changing means for independently adjusting the delay time introduced by said delay means of leading and falling edges of said comparison signal in response to said idle-off timer means and said engine speed detector circuit means.

4,425,896

FUEL INJECTION ADVANCE APPARATUS

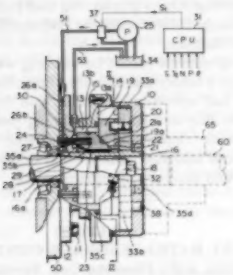
Fumiaki Murayama, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 15, 1982, Ser. No. 358,325

Claims priority, application Japan, Mar. 31, 1981, 56-47087[U]

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—501 **10 Claims**



1. A fuel injection advance apparatus in an internal combustion engine with a fuel injection device and an engine-driven pump, comprising a rotational hub which is connected to a cam shaft of the fuel injection device, an engine-driven rotatable casing which is supported on and about the rotational hub so as to rotate relative to the latter, plural eccentric cam assemblies with eccentric pins which are located between the hub and the casing to adjust a relative angular position therebetween in order to control the injection of the fuel of the fuel injection device, a hydraulic piston which is slidably supported on the hub and which is connected to the engine-driven pump, said hydraulic piston being provided, on one end, with an inclined surface, and slides which are capable of radial movement and which have inclined surfaces corresponding to and contacting the inclined surface of the piston so that the axial movement of the piston is converted to the radial movements of the slides by means of the cooperation of the inclined surface of the piston and the inclined surfaces of the slides, said slides being connected to the eccentric pins so that the eccentric cam assemblies can be rotated by the radial movements of the slides.

4,425,897

DEVICE FOR THE FEEDING OF AN INTERNAL COMBUSTION MOTOR WITH GAS

Yves Irvoas, Pont Ar Bloc'h Pleyer Christ, 29223 Saint Thegonnec, France

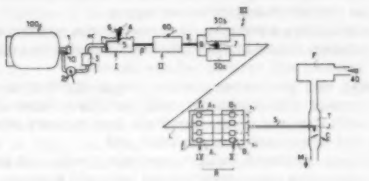
Filed Apr. 30, 1981, Ser. No. 259,337

Claims priority, application France, Apr. 30, 1980, 80 09747; Sep. 12, 1980, 80 19786; Mar. 4, 1981, 81 04681

Int. Cl.³ F02M *13/08*

U.S. Cl. 123—527 **12 Claims**

1. In combination with an internal combustion motor having an intake manifold and a feed source of air at an excess pressure, a device for providing a gaseous fuel to the said motor, said device comprising a plurality of interconnected stages of pressure reduction interposed between a reservoir of fuel and the motor, these stages including at least one inlet stage coupled to the reservoir and comprising a pressure reducer loaded by spring means and providing a substantially constant pressure slightly greater than atmospheric and a final stage having an outlet coupled to the said intake manifold, wherein at least the said final stage comprises at least one pressure reducer having a non-loaded diaphragm and is arranged to provide substantially no pressure reduction and to operate on substantially nil excess pressure and, at starting up and slowing down,



in transitory alternating working conditions with oscillatory motion of the diaphragm as a function of the lowering of pressure in the said intake manifold, the fluctuations of which are thereby smoothed.

4,425,898

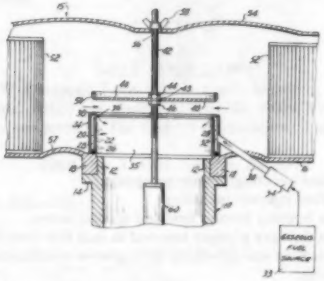
GASEOUS FUEL-AIR MIXTURE DEVICE

Kerry L. McLean, 20540 Westhampton, Southfield, Mich. 48075

Continuation-in-part of Ser. No. 138,434, Apr. 8, 1980, Pat. No. 4,335,697. This application Nov. 9, 1981, Ser. No. 319,636

Int. Cl.³ F02M *21/02*

U.S. Cl. 123—527 **7 Claims**



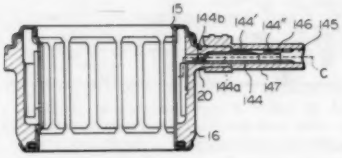
1. A gaseous fuel-air mixer for an internal combustion engine having an intake for a fuel-air mixture, said intake being a liquid fuel conventional carburetor inlet and said gaseous fuel-air mixer comprising a tubular member mounted at said carburetor inlet, said tubular member surrounding said inlet and having an open end through which air is admitted, means for supplying a gaseous fuel to a mixing chamber defined within said tubular member, and a generally flat plate, said plate being axially adjustable along the carburetor inlet axis and disposed across the open end of said tubular member defining said mixing chamber for adjusting the proportion of air admitted to said mixing chamber, wherein said gaseous fuel is supplied to said mixing chamber through an aperture in said tubular member, said tubular member has a pair of parallel circularly cylindrical walls disposed concentrically for forming therebetween an annular chamber, and said aperture is a circular slot in the innermost of said cylindrical walls.

4,425,899

INTAKE HEATING DEVICE OF AN INTERNAL COMBUSTION ENGINE

Keigo Kato, and Yoshio Kuroiwa, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 9, 1982, Ser. No. 386,604
Claims priority, application Japan, Mar. 2, 1982, 57-31673
Int. Cl.³ F02M 31/00
U.S. Cl. 123—549 5 Claims



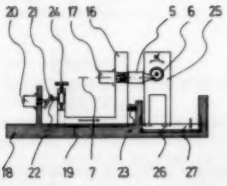
1. An intake heating device of an internal combustion engine, which has a hollow heater vessel placed in an intake passage between the fuel supply means and a cylinder of the engine, said hollow heater vessel comprising an inner pipe having therein a mixture passage which is aligned with the intake passage, an outer pipe radially spaced from and surrounding said inner pipe, said inner and said outer pipes being coupled to each other so as to define an enclosed area therebetween, a plurality of PTC elements inserted in said enclosed area between said inner and said outer pipes, and power supply means for applying voltage between the inner walls and the outer walls of the said PTC elements, said power supply means comprising lead members which extend across the wall of said outer pipe, wherein the improvement comprises: said lead members being embedded integrally in said outer pipe in the course of the outer pipe casting; and at least one of said lead members having a tubular cross section which extends across the whole or a part of said outer pipe wall and along which a through hole can be provided for flowing a certain amount of air into said enclosed area.

4,425,900

METHOD AND APPARATUS FOR BRUTING PRECIOUS OR SEMI-PRECIOUS STONES

Hendrik Bosschaert, Edegem, Belgium, assignor to Wetenschappelijk en Technisch Onderzoekscentrum voor Diamant, Antwerp, Belgium

Filed Aug. 26, 1981, Ser. No. 296,552
Claims priority, application United Kingdom, Aug. 18, 1980, 8026893
Int. Cl.³ B28D 5/00
U.S. Cl. 125—30 R 8 Claims



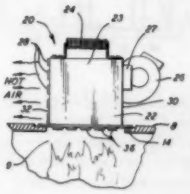
1. A method of bruting two precious or semi-precious stones including mounting said stones on respective first and second rotating shafts whose axes lie in substantially parallel planes but which intersect in the region of said stones when viewed in projection perpendicular to said planes, the girdle surfaces of said stones making grinding contact, one of said shafts being substantially translated relative to the other in its said plane such that the reference point of its stone as herein defined travels along a path in said plane which reaches substantially all points within a parallelogram defined by pairs of lines parallel to the respective shafts, the length of the respective sides of the parallelogram being equal to the height of the girdles of respective stones and the centre of the parallelogram lying over the reference point of the other stone when viewed in said projection.

4,425,901

HEAT EXCHANGE DEVICE

Gordon Callison, Box 638, R.D. #2, Waverly, N.Y. 14892

Filed Jun. 15, 1981, Ser. No. 273,678
Int. Cl.³ F24C 1/14, 15/10
U.S. Cl. 126—6 4 Claims



1. In combination with a wood burning type stove a heat exchange device for transferring heat from said wood burning stove having a circular opening of first predetermined diameter surrounded by a peripheral lip of second predetermined diameter in a top wall thereof, said opening directly overlying the fire box of the stove, said device comprising:

(a) an essentially flat, circular plate having a diameter between said first and second diameters and thus adapted to lie in covering relation to said opening, surrounded by said lip;

(b) a plurality of elongated, hollow tubular members of substantially equal length extending through said plate and having lower open ends and upper closed ends, whereby when said plate is in covering relation to said opening said lower ends extend into the stove fire box;

(c) housing means affixed to the upper surface of said plate and enclosing all of the portions of said tubes on the upper side of said plate which portions extend substantially to the top of said housing;

(d) said housing having first and second vertical walls on opposite sides thereof, said first wall having a first opening therethrough and said second wall having a plurality of second openings therethrough; and

(e) blower means affixed to said housing in surrounding relation to said first opening to direct air from outside to inside said housing, whereby air passes through said first opening, through said housing in contact with the portions of said tubes on the upper side of said plate to receive heat therefrom and out of said housing through said second plurality of openings to heat the ambient air.

4,425,902

SUBMERSIBLE DEVICE FOR HEATING LIQUIDS

Alain Thouault, Paris; Claude Chapuis, Epinay sur Seine, and Georges Austruy, St. Denis, all of France, assignors to Gaz de France, France

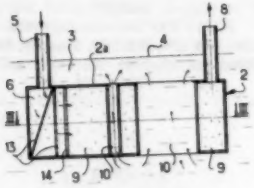
Filed Apr. 7, 1982, Ser. No. 366,308
Claims priority, application France, Apr. 8, 1981, 81 07059
Int. Cl.³ F24H 1/20
U.S. Cl. 126—360 R 4 Claims

1. A submersible device for heating liquids, comprising a parallelepiped caisson immersible in a liquid to be heated and having a top wall and a bottom wall, said caisson having a first portion and a second portion;

a combustion chamber in said first portion of said caisson and having vertical ducts traversing said combustion chamber between said top and bottom walls of said caisson in fluid-tight relationship therewith;

a fuel premixing and homogenizing chamber forming said second portion of the said caisson;

at least one flame stabilizing grate arranged between the



walls of said caisson and separating said second portion of said caisson from said first portion thereof;

at least one conduit opening above said liquid and connected to said second portion of said caisson for feeding fuel to said premixing and homogenizing chamber; and

at least another conduit opening above said liquid and connected to said first portion of said caisson for conducting exhaust gases from said combustion chamber.

4,425,903

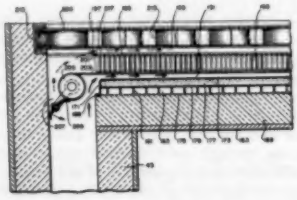
CHEMICAL HEAT PUMP

Leonard Greiner, 2853-A Hickory Pl., Costa Mesa, Calif. 92626

Division of Ser. No. 135,726, Mar. 31, 1980, abandoned, which is a division of Ser. No. 958,507, Nov. 7, 1978, Pat. No. 4,224,803, which is a continuation-in-part of Ser. No. 842,702, Oct. 17, 1977, abandoned. This application Nov. 12, 1981, Ser. No. 320,665

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—419 **7 Claims**



1. A solar collector, comprising:

a surface for direct illumination by and collection of solar energy;

a pair of transparent covers located above said surface in a spaced relationship therewith to provide a first flow channel defined by said surface and one of said pair of covers, and a second flow channel defined by said one of said pair of covers and the other of said pair of covers; and

means for selectively channeling air through said first flow channel when the intensity of solar energy on said surface is below a predetermined value and through said second flow channel when the intensity of solar energy on said surface exceeds the predetermined value for heat exchange with said surface to control thermal eddies.

4,425,904

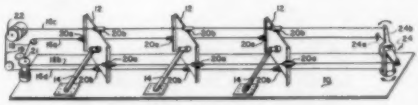
TRACKING SYSTEM FOR SOLAR COLLECTORS

Barry L. Butler, Golden, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 1, 1980, Ser. No. 192,799

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—424 **4 Claims**



1. A solar collector tracking system comprising;

at least one solar collector;

pivotal mounting means attached to said solar collector;

at least two linkage means connected to said collector at spaced-apart portions thereof, said linkage means including elongated electrically insulated electrical conductor portions;

drive means for displacing said linkage means so as to cause said solar collector to pivot, thereby aligning said solar collector in a predetermined direction;

fine tuning adjustment means including a frame supported from said linkage means;

a follower connected to said collector;

an elongated shaft connected to said frame, said shaft threadingly engaged with said follower;

an electric motor, connected to said shaft for rotational drive thereof; and

fine tuning adjustment means including means electrically connecting said conductor portions to said motor.

4,425,905

SUNLIGHT COLLECTING AND CONCENTRATING APPARATUS

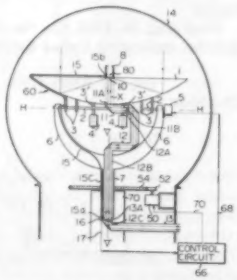
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jul. 15, 1982, Ser. No. 398,635

Claims priority, application Japan, Jul. 18, 1981, 56-112510

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—425 **16 Claims**



1. A sunlight collecting and concentrating apparatus, comprising: a collector means for collecting and concentrating the sunlight; a first support means for rotatably supporting the collector means about a first axis of rotation; a second support means for rotatably supporting the first support means about a second axis of rotation perpendicular to the first axis, one of said first and second axis being horizontal and the other being vertical; detecting means movable with the collector means for detecting the sun's azimuth and altitude; drive means for generating independent movement of the collector means about the first and the second axis of rotation; transmission means for

transmitting signals from the detecting means to the drive means so that the collector means follows the daily and hourly changes in the sun's azimuth and altitude to keep the collector means always facing the sun; first optical conductor means for transmitting light arranged to move together with the collector means; second optical conductor means for transmitting light to a predetermined area outside of the apparatus, said second optical conductor means being arranged to move together with the first support means; and coupling means arranged between the first and second optical conductor means for transmitting the light from the former to the latter while permitting relative rotation therebetween.

4,425,906

SOLAR HEATING SYSTEM IN A BUILDING

Curt H. Ingeström, Fornminnesvägen 5, S-446 00 Älvängen, Sweden

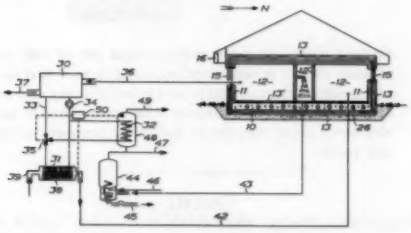
PCT No. PCT/SE81/00089, § 371 Date Nov. 18, 1981, § 102(e) Date Nov. 18, 1981, PCT Pub. No. WO81/02775, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 18, 1981, Ser. No. 324,396

Claims priority, application Sweden, Mar. 18, 1980, 80021066; Jun. 16, 1980, 80044514

Int. Cl.³ F24J *3/02;* **A63C** *19/10;* **F25B** *29/00*

U.S. Cl. 126—427 **5 Claims**



1. Solar heating system in a building with a sun collector **(16)** and a heat reservoir **(10)**, characterized by the combination of a first circuit for air which has been heated in the sun collector **(16)**, comprising a passage system **(26)** in a bottom slab **(10)** of concrete arranged as the heat reservoir, which is insulated on the outside and towards the interior of the building with the insulation **(13')** towards the interior of the building adjusted to control the heat supply from the reservoir upwards into the spaces **(12)** of the building, and a second circuit with a heat pump, separated from the first circuit and comprising an evaporator **(30)** and a condensor **(31, 32)** for the supply of air from the outside to the spaces **(12)** of the building during heat exchange with the condensor to heat the air supplied to the spaces and discharge air from the spaces of the building in heat exchange relationship with the evaporator **(30)**.

4,425,907

REFLECTOR-COUPLED FLUORESCENT SOLAR COLLECTOR

Lawrence B. Younghouse, Boonton, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 190,666, Sep. 25, 1980, abandoned. This application Nov. 27, 1981, Ser. No. 325,281

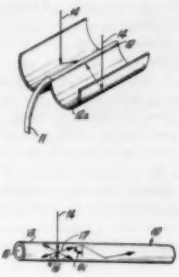
Int. Cl.³ F24J *3/02*

U.S. Cl. 126—439 **7 Claims**

1. A device for the collection and transmission of electromagnetic radiation comprising:

a cylindrical fluorescent fiber formed from a light transparent fiber material on which has been applied at least one fluorescent sheet, said fluorescent sheet being formed from a fluorescent dye incorporated in a polymeric binder;

reflector means for reflecting radiation impinging over a relatively wide area so as to impinge on the circumference of said fluorescent fiber;



at least one optical wave guide optically coupled to one end of said fluorescent fiber whereby light impinging on said fluorescent fiber is internally reflected and transmitted by said optical wave guide to a point of use.

4,425,908

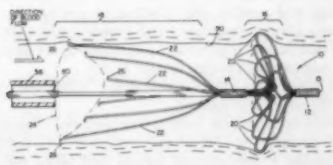
BLOOD CLOT FILTER

Morris Simon, Boston, Mass., assignor to Beth Israel Hospital, Boston, Mass.

Filed Oct. 22, 1981, Ser. No. 314,005

Int. Cl.³ A61M *29/00;* **A61B** *19/00*

U.S. Cl. 128—1 R **9 Claims**



1. A blood clot filter comprising a plurality of wire portions composed of material having a first, low-temperature condition and a second, high-temperature condition, said material in its low-temperature condition being relatively pliable and in its high-temperature condition being resiliently deformable and relatively rigid and taking a pre-determined functional form, said material having its high-temperature condition at about body temperature,

in both material conditions, said filter having a longitudinal axis and a leading end located on said axis, said wire portions being confined together at said filter leading end to form a tip, said wire portions being confined together at a median place on said axis spaced from said filter leading and, said wire portions having free ends remote from said tip and said median place, said wire portions between said median place and said free ends defining legs,

in said material high-temperature condition, said filter comprising coaxial first and second filter baskets, each said filter basket being generally symmetrical about said longitudinal axis and opening away from said filter leading end.

4,425,909

LARYNGOSCOPE

Michael J. Rieser, 525 W. Earll, No. 318, Phoenix, Ariz. 85013

Filed Jan. 4, 1982, Ser. No. 336,697

Int. Cl.³ A61B *1/26*

U.S. Cl. 128—16 **2 Claims**

1. A laryngeal speculum for

examining the throat and larynx of a supine patient, and

inserting an endotracheal tube into the mouth and trachea of a patient so that the patient can breath if the patient vomits and the trachea is obstructed during administration of medical aide,

said speculum including:

(a) an elongate blade having

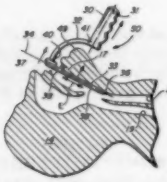
(i) a longitudinal axis,

(ii) a first end inserted into the mouth and throat of a patient during utilization of the laryngeal speculum,

(iii) a second end generally positioned outside said mouth of the patient during utilization of said speculum, and

(iv) a central portion located between said first and second ends along the longitudinal axis of the blade,

(b) an elongate handle having a longitudinal axis generally perpendicularly disposed to said longitudinal axis of said blade, the user of said speculum grasping said handle and exerting a resultant lifting force parallel to said longitudi-



nal axis of said handle in a direction away from said patient to expand and open the mouth and throat of the patient for examination after said blade is inserted therein; and

(c) a neck having one end attached to said second end of said blade and another end attached to said handle, said neck being shaped, contoured and dimensioned such that

(i) said handle is generally positioned apart from and over said central portion of said blade,

(ii) when said blade is positioned inside the mouth and throat of said patient,

said neck extends from said second end of said blade and around the chin of said patient to said handle, and

torque forces on said handle and blade are generally prevented from occurring when said lifting force is applied to said handle and said blade is forced against the tongue and anterior portions of the throat of the supine patient.

4,425,910

SEAT HAVING AN ADJUSTABLE BACKREST

Hermann Meiller, Pfistermeisterstr. 39, D-8450 Amberg, Fed. Rep. of Germany

Filed Nov. 27, 1981, Ser. No. 325,496

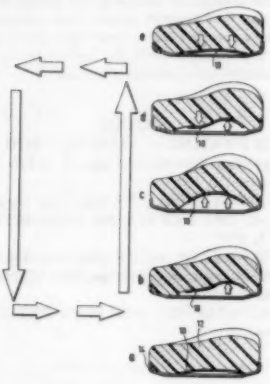
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045809

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—52 **10 Claims**

1. A seat having a backrest including a backrest cushion positioned on a backrest structure which comprises an adjustable vertebral support positioned within said backrest and comprised of first and second adjusting elements disposed one above the other in a heightwise direction adapted to act on a rear portion of said backrest cushion, said adjusting elements being comprised of spring plate members having first and second ends, said first ends of said spring plate members being fixedly held, said second end members being movably mounted to permit curving of said spring plate members, said second end members being mounted to a common connecting member displaceably mounted to said backrest structure of said backrest by spaced apart pin-and-slot type guide elements, said spaced apart pin-and-slot type guide elements being disposed from one another in said heightwise direction; and

an actuating member for cooperating with said connecting member and disposed between said guide elements transversely movably with respect to said heightwise direction of said backrest whereby movement of said actuating member against spring force of said spring plate member causes said spring plate member closest to a point at which said actuating member cooperated with said connecting member to pivot about said pin of said guide element



furthest from said point whereat said pin of said guide element closest to said point is caused to abut said slot of said guide element closest to said point whereby said other spring plate member is caused to be compressed to pivotally move about said pin of said guide member closest to said point.

4,425,911

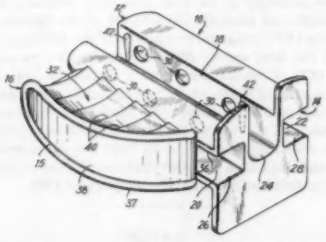
BITE-BLOCK

Raymond Luomanen, 484 West Shore Trail, Sparta, N.J. 07871, and Jack C. Luomanen, 1818 Acton St., Berkley, Calif. 94702

Filed Jul. 27, 1981, Ser. No. 287,057

Int. Cl.³ A61M *25/02*

U.S. Cl. 128—200.26 **7 Claims**



1. A bite-block for use by a human subject comprising:

a body having a substantially rectangular cross section having an anterior end and a posterior end, said body including a U-shaped central channel having an open top, and a pair of open-sided U-shaped channels on either side of said central channel;

a transverse plate secured to the anterior end of said body, said plate being engageable over the mouth of said subject and having apertures communicating with said channels; and

a projection secured to one side of said body and extending laterally therefrom from a point spaced from said plate to a point near the posterior end thereof, said projection extending laterally sufficiently such that said body is disposed substantially centrally of the mouth and said projec-

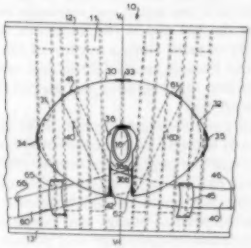
tion is disposed between upper and lower teeth other than the incisors when the bite-block is disposed in the mouth, said projection including upper and lower surfaces conforming to the curve of Spee, said upper surface being configured for engagement with said upper teeth other than the incisors and said lower surface being configured for engagement with said lower teeth other than the incisors, said upper and lower surfaces being sufficiently spaced apart to preclude clamping of the incisors on said body when said upper and lower teeth other than the incisors engage, respectively, the upper and lower surfaces of the projection.

4,425,912

KNEE PROTECTOR/STABILIZER

Oris E. Harper, Asheboro, N.C., assignor to Rampon Products, Inc., Asheboro, N.C.

Filed Jun. 11, 1982, Ser. No. 387,757
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 C **4 Claims**



1. A knee brace adapted for protecting and stabilizing the knee joint area of the user, comprising:

(a) a tubular elastic knit fabric sleeve adapted to receive the leg of a user and to be positioned over and to cover the knee joint area, said sleeve having on the front side thereof a first opening formed therein for positioning over the kneecap of the leg and below said first opening, second and third peripherally-spaced openings adapted for passing securing straps therethrough;

(b) internal pad means, comprising:

(i) a pair of laterally-spaced, semi-annularly-shaped resilient pad members;

(ii) a fabric cover providing on either side of a central vertical axis a pair of outwardly extending semi-annular-shaped pouches stitched to the inside of said sleeve on the outer sides thereof and conforming in shape to the shape of said pads and loosely enclosing said pads, said pouches having interconnecting fabric at the top of said cover secured to said sleeve and being separated and laterally-spaced in the bottom portion of said cover, whereby to provide a pair of opposed semi-annular-shaped fabric covered pads within said sleeve and around said opening and arranged such that the tops of said pads can remain relatively fixed while the bottoms of said pads are adjusted to conform the positioning of said pads to the shape of the knee joint area surrounding said kneecap; and

(c) a pair of securing straps having inner end portions residing within and outer end portions residing outside said sleeve, said inner end portions being arranged so as to cross within said sleeve below said opening and so as to have each respective terminal end thereof secured to upper and lower edges of a respective said pouch adjacent the inner wall of said sleeve, said inner end portions extending outwardly through respective said peripherally-spaced second and third openings in said sleeve with said outer end portions forming continuations thereof and being arranged to spiral upwardly around said sleeve, to cross on the outside of said sleeve below said opening on the front of said sleeve and to terminate with free ends near the upper edge of said sleeve and on the back of said sleeve, said free ends having means associated therewith for enabling said free ends to be releasably secured together whereby said straps by loosening and tightening the same outside said sleeve may be employed to adjust the relative positioning and compression of said pads against the areas of the said knee joint which they contact.

4,425,913

SPLINT FOR USE WITH INTRAVENOUS LINE

Jamie B. Lewis, 28120 S. Ridgeforest Ct., Rancho Palos Verdes, Calif. 90274

Filed Oct. 5, 1981, Ser. No. 308,323
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—133 **1 Claim**

1. A splint for supporting a patient's hand and at least a portion of the forearm to receive an intravenous line, comprising:

a substantially rigid, one-piece plastic body substantially symmetrical with reference to a center line and adapted to overlie the ventral aspect only of the patient's hand, wrist and forearm, and defining a dome for mating engagement with the palm only of the hand and a transversely arcuate channel extending away from said dome to receive said portion of the forearm, said dome disposed to support the hand in a substantially neutral position with regard to the forearm and terminating proximal the phalanges of the hand to permit free movement of the thumb and fingers thereon, the body defining edges turned to further rigidify the body, said edges each defining securing means in the form of grip sections for non-compressably receiving the intravenous line;

a plurality of ventilating apertures disposed through the dome; and

fastener means for attaching the splint to the hand and forearm, said fastener means including a first strap disposed to retain the hand against the dome portion, a second strap disposed to retain the wrist against an intermediate portion of the splint, and a third strap disposed to retain the portion of the forearm against the transversely arcuate channel.

4,425,914

HUMIDIFIER-INJECTOR FOR JET VENTILATOR

Cole Ray; John Vincent, both of New York, and Clifford Small, Jamaica, all of N.Y., assignors to Memorial Hospital for Cancer and Allied Diseases, New York, N.Y.

Filed Feb. 10, 1981, Ser. No. 233,245
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—200.14 **11 Claims**

1. A humidifier-injector for a jet ventilator and adapted to mount to an airway connector, said humidifier-injector comprising a first pipe with means for receiving and conducting high frequency pulses of high velocity gas and means for

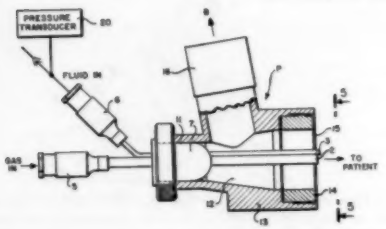
directing said gas exiting said first pipe; a second pipe with means for receiving and conducting a humidifying fluid and means for directing said fluid exiting said second pipe; and sealing means intermediate the receiving and directing means of said first and second pipes, wherein:

(a) said receiving means of said first pipe permits gas-tight communication between said conducting means of said first pipe and a source of high frequency pulses of high velocity gas;

(b) said receiving means of said second pipe permits fluid-tight communication between said conducting means of said second pipe and a source of humidifying fluid;

(c) said directing means of said second pipe directs said exiting fluid such that said fluid is impacted by the flow of said gas exiting said first pipe;

(d) said sealing means comprising first and second cylindrical portions, each of said cylindrical portions being substantially coaxial with said first and second pipe conducting means, wherein:



(1) said first cylindrical portion is of small diameter than said second cylindrical portion, extends from a first point on said conducting means to a remote point intermediate said second cylindrical portion and said first and second pipe directing means, and is adapted to fit into a cylindrical inlet in an airway connector; and

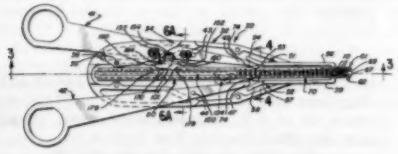
(2) said second cylindrical portion is adjacent said first cylindrical portion, is located intermediate the remote point of said first cylindrical portion and said first and second pipe receiving means, and coacts with said first cylindrical portion to (i) locate and maintain said first and second pipe conducting means coaxially within said airway connector inlet and (ii) to effect a seal between the interior of said airway connector inlet and the atmosphere.

4,425,915

SURGICAL CLIP APPLIER WITH IN-LINE CARTRIDGE AND INTERRUPTABLE BIASED FEEDER

Konstantin Ivanov, Edison, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Feb. 26, 1982, Ser. No. 352,832
Int. Cl.³ A61B *17/12*
U.S. Cl. 128—325 **19 Claims**



1. A repeating scissors-type medical instrument for applying a plurality of ligating clips seriatim about tissue wherein each said clip is initially provided in an open state, each said open clip comprising first and second legs joined at their proximal ends by a resilient hinge and being spaced apart at their distal ends with said legs having latch means at said distal ends for holding said clip closed in clamping engagement about said tissue when said legs are squeezed together, said instrument comprising:

first and second jaws disposed in confronting relationship and mounted for pivotal movement away from each other into an opened position to receive one of said clips and toward each other into a closed position for closing and latching said one clip;

first and second scissors-type handles for operating said jaws, said scissors-type handles being mounted to said instrument for pivoting toward each other from an open position wherein said jaws can be opened to a closed position for effecting movement of said jaws to said closed position;

a magazine defining a channel for receiving said open clips in a single row with the clips arranged in nesting relationship with the hinge of one clip being received between the distal ends of the legs of a next rearwardly adjacent clip, said magazine disposed on said instrument to feed said clips forwardly to said jaws with the hinge of each clip trailing the distal ends of the clip legs;

a pusher bar slidably carried on said instrument and aligned to enter into one end of said magazine and push forwardly against the last clip in the magazine, said bar defining a plurality of teeth along a portion of the length of the bar;

pusher bar biasing means for biasing said pusher bar forwardly into said magazine and against the last clip in said magazine; and

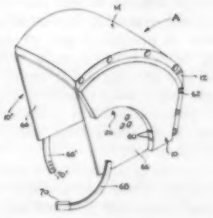
a toothed pawl for engaging said teeth on said pusher bar, said pawl being mounted to one of said handles forwardly of the region of engagement between said pusher bar teeth and said pawl so as to accommodate pivoting movement whereby movement of said handles toward each other causes the pawl to engage said pusher bar and pivot in a first direction to disengage said pusher bar from the last clip in said magazine and whereby movement of said handles away from each other permits the pawl to be pivoted in a second direction by the movement of said pusher bar forwardly on said instrument against the last clip in the row in said magazine under the influence of said pusher bar biasing means to position the front clip in the row at the opened jaws.

4,425,916

CAP STRUCTURE FOR CREATING TEMPERATURE CONTROLLED ENVIRONMENT FOR REDUCING ALOPECIA

Mark Bowen, Los Angeles, Calif., assignor to Therapeutic Products, Inc., Los Angeles, Calif.

Filed Jun. 1, 1979, Ser. No. 44,510
Int. Cl.³ A61F *7/00*
U.S. Cl. 128—403 **1 Claim**



1. A cap structure for reducing alopecia of a patient undergoing cytotoxic drug treatment by application of said structure to the head of said patient to create a cold environment around a substantial portion of the scalp of the patient, said structure comprising

(a) a plurality of fabric panels comprised of a top panel, a

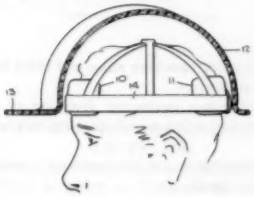
back panel and two side panels connected by flexible members, each of said panels having at least one individual substance receiving chamber and a flexible fabric member with fasteners for operatively connecting each of said panels to at least one other panel in order to faciliate conforming said panels into said cap structure to fit closely around the scalp portion of the patient, and

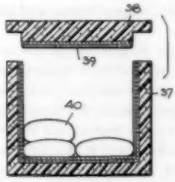
(b) a substance in each of the internal chambers in each of said fabric panels capable of being reduced to a low temperature substantially below body temperature and retaining said low temperature for a substantial period thereby to maintain a reduced temperature environment about the scalp portion of the patient for a period before and after said treatment.

4,425,917
HEAT EXCHANGE SYSTEM FOR BODY SKIN

Lawrence Kuznetz, 12214 Lakewood Blvd., Downey, Calif. 90241

Filed May 7, 1981, Ser. No. 261,460
Int. Cl.³ A61F *7/00*
U.S. Cl. 128—403 **14 Claims**





1. A heat exchange system for personal use in the field to provide cooling effects, said system comprising:

(A) an article of head apparel having an inner zone that encircles the head of the wearer; and

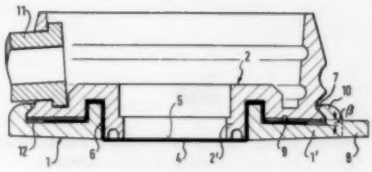
(B) a flexible thermal assembly interposed between a portion of the inner zone and the skin to conform to the contour of the skin, said assembly being constituted by a holder formed of a fabric having good wicking properties and a replaceable cartridge inserted therein formed by a sealed flexible envelope of synthetic plastic film material enclosing a gel having a much lower freezing point than water, and water-filled plastic cells immersed in said gel to create, when frozen, ice blocks within the cartridge, thereby combining the heat of fusion characteristic of the ice with the higher cooling capacity of the gel to lengthen the effective cooling period of the cartridge, said cartridge being activatable to cause said mass to assume a uniform cold temperature; and

(C) a portable storage device containing a supply of preactivated cartridges making it possible to replace deactivated cartridges in the field.

4,425,918
MEMBRANE RETAINER ARRANGEMENT FOR PHYSIOLOGICAL SENSING UNITS

Hermann Moll; Helmut J. Leist; Karl-Heinz Pomorin, and Georg J. Ullrich, all of Freiburg im Breisgau, Fed. Rep. of Germany, assignors to Hellige GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Oct. 2, 1981, Ser. No. 307,722
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040544
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—635 **13 Claims**



1. A retainer arrangement for applying a membrane to a physiological sensing unit for the transcutaneous determination of the magnitude of physiological quantities, particularly for measuring the partial pressure of gases in blood or the like, comprising:

a membrane;

a clamping ring having a generally central opening and a peripheral annular recess receiving the rim of the membrane so that the membrane spans the opening;

the clamping ring having a lip in the form of an inwardly protruding annular edge for removably securing the clamping ring together with the membrane to the sensing unit by virtue of the lip resiliently snapping into a peripheral groove of the sensing unit, the lip defining the periphery of the annular recess; and

means including an auxiliary retainer element, for temporarily and removably assembling the membrane with the clamping ring prior to assembly with the sensing unit, wherein the auxiliary retainer element includes a retainer ring fitted loosely into the annular recess of the clamping ring, the retainer ring maintaining the outer rim of the membrane within the annular recess.

4,425,919
TORQUE TRANSMITTING CATHETER APPARATUS

William W. Alston, Jr., Palo Alto; William G. Bloom, San Francisco, and William C. Johnson, Menlo Park, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

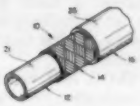
Filed Jul. 27, 1981, Ser. No. 287,015
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—658 **9 Claims**

1. A torque transmitting catheter apparatus for inserting diagnostic fluid into body tissue, the catheter being inserted into the body by a process of feeding and rotating the apparatus through body tissues such as arteries and the like body passageways, the apparatus comprising:

a longitudinally pre-oriented thin-walled tubular substrate;

a thin-walled reinforcing means surrounding and in contact with the substrate, the reinforcing means comprising a braid of flat wires wound over the substrate; and

a thin-walled tubular superstrate surrounding the reinforcing means, and in contact with the substrate, forcing the rein-



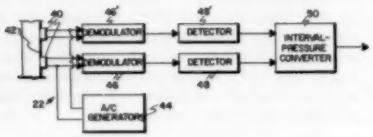
forcing means against the substrate and maintaining the reinforcing means wound over the substrate.

4,425,920

APPARATUS AND METHOD FOR MEASUREMENT AND CONTROL OF BLOOD PRESSURE

Joe D. Bourland; Leslie A. Geddes; Charles F. Babbs, and Willis A. Tacker, Jr., all of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Oct. 24, 1980, Ser. No. 200,570
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—672 **3 Claims**



1. An apparatus for measuring blood pressure, said apparatus comprising:

a pair of electrode sets for positioning adjacent to and outside an artery;

alternating current generator means for providing alternating current to each of said electrode sets;

first and second demodulator means each of which is connected with a different one of said electrode sets for forming pulses in response to receipt of signals from said electrode sets due to the impedance offered to said alternating current between the electrodes of said electrode sets to thereby determine the pulse transit time of blood flowing through said artery;

first and second detector means each of which is connected with a different one of said first and second demodulator means to indicate the time of arrival of pulses from said demodulator means and form therefrom arterial pulse waves; and

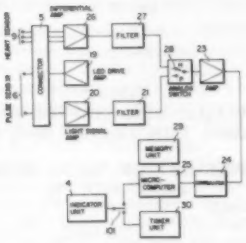
time interval measuring means connected with said first and second detector means for receiving said arterial pulse waves therefrom and responsive thereto providing an electrical signal output that is indicative of blood pressure sensed in said artery.

4,425,921

APPARATUS FOR CHECKING PULSE AND HEART RATES

Iwao Fujisaki, Ichikawa; Shuichi Kosuge, Tama; Syuu Ogawa, Kasukabe; Kimihiko Sato, Funabashi, and Toshimi Soeda, Tokyo, all of Japan, assignors to Senoh Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1981, Ser. No. 301,122
Claims priority, application Japan, Jan. 19, 1981, 56-5955
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—690 **5 Claims**



1. An apparatus for checking pulse and heart beat rates of a person, which comprises:

(a) heart beat sensor means for detecting an electrocardiowave and outputting an electrocardiowave voltage signal;

(b) pulse beat sensor means for detecting a pulse and outputting a pulse signal;

(c) connector means to which either one of said heart beat sensor means and said pulse beat sensor means is selectively connected;

(d) analog switch means connected by said connector means to said heart beat sensor means and said pulse beat sensor means;

(e) microcomputer means connected to said analog switch means, said analog switch means connecting said heart beat sensor means to said microcomputer means when said heart beat sensor means is connected to said connector means and said pulse beat sensor means to said microcomputer means when said pulse beat sensor means is connected to said connector means, said microcomputer means operable for calculating either one of said heart beat rate per minute and said pulse beat rate per minute in response to either of the electrocardiowave voltage signal and the pulse signal; and

(f) indicator means connected to said microcomputer means for displaying the calculated heart beat rate or pulse beat rate.

4,425,922

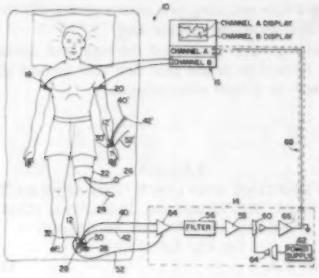
ELECTRICAL METHOD AND APPARATUS FOR NON-INVASIVELY DETECTING ABNORMAL FLOW IN CONDUITS

James C. Conti; Elaine Strope, both of East Northport; Eugene Findl, Amityville, and Cynthia Griffiths, Port Jefferson Station, all of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Filed Apr. 7, 1981, Ser. No. 251,743
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—691 **8 Claims**

1. Apparatus for non-invasively detecting reduced blood flow downstream of the heart comprising:

means for detecting the streaming potential of an artery and producing a signal in response thereto;
means for detecting the ECG signal; and

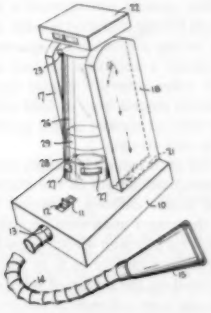


means for permitting simultaneous analysis of said streaming potential and said ECG signal.

4,425,923
INCENTIVE SPIROMETER WITH AUTOMATIC LEVELLING

Marvin Gordon, East Winsor, and Joseph Lichtenstein, Colonia, both of N.J., assignors to Whitman Medical Corporation, Clark, N.J.

Filed Nov. 23, 1981, Ser. No. 324,379
Int. Cl.³ A61B 5/08
U.S. Cl. 28—727 **11 Claims**

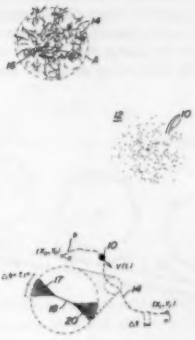


1. An incentive spirometer comprising:
an inhalation flow path through which air flows in response to an inhalation suction force applied thereto by a patient;
a support frame;
a hollow column disposed in said flow path and supported by said frame, said column having first and second ends;
incentive means disposed in said column to move in opposition to gravity therein toward said second end in response to inhalation air flow through said column from said first end toward said second end; and
levelling means for automatically maintaining said column in a substantially vertical orientation, with said second end being disposed above said first end, in response to tilting of said frame in at least one plane.

4,425,924
BLOOD VELOCITY MEASUREMENT IN RETINAL CAPILLARIES UTILIZING THE BLUE FIELD ENTOPTIC PHENOMENON

Charles E. Riva, and L. Benno Petrig, both of Myrin Cir., 51 N. 35th St., Philadelphia, Pa. 19104

Filed Sep. 29, 1981, Ser. No. 306,699
Int. Cl.³ G01P 3/36
U.S. Cl. 128—745 **17 Claims**



1. A method for determining the speed of leukocytes in retinal capillaries comprising the steps of: simulating by means of a visual display the appearance and motion of entoptically seen leukocytes in retinal capillaries, observing the entoptic appearance of actual leukocytes in the retinal capillaries of the subject eye, and comparing and matching the appearances of the display and the actual leukocytes whereby correspondence of the appearances of the display and the actual leukocytes is indicative of the speed of the actual leukocytes.

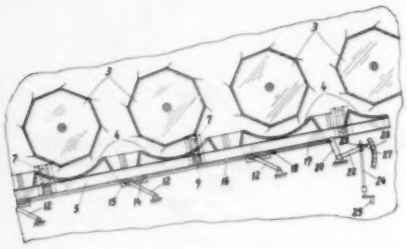
4,425,925
HARVESTER THRESHER

Hermann Kersting, Oelde, and Heinrich Roderfeld, Harsewinkel, both of Fed. Rep. of Germany, assignors to Claas OHG, Harsewinkel, Fed. Rep. of Germany

Filed Apr. 2, 1982, Ser. No. 364,666
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114382
Int. Cl.³ A01F 12/44
U.S. Cl. 130—22 A **10 Claims**

1. A harvester thresher, comprising threshing means including a threshing drum and a threshing basket associated there-

with; separating means located downstream of said threshing means as considered in a transportation direction, and including a plurality of separating drums spaced from one another in the transportation direction and a plurality of separating elements each associated with a respective one of said separating drums and having two end portions spaced from one another in a transverse direction; supporting means arranged to support said separating elements of said separating means and including two elongated supporting elements extending in the transportation direction and spaced from one another in the transverse direction and each supporting a respective one of the portions of each of said separating elements of said supporting means; wall means including two lateral walls spaced from one another in the transverse direction and having elongated openings; mounting means arranged to mount each of said supporting elements in the elongated openings of a respective one of said lateral walls on said wall means so that said supporting elements together with said separating elements of said separating means are displaceable in an upright direction and fixable in a plurality of upright positions, said mounting means being formed as displacing means which positively lockingly lift and lower said supporting elements; and a plurality of guiding members connected with each of said supporting elements and each having an elongated slot extending in the transportation direction, said displacing means further including a plurality of turntable levers each having one end provided with a pin which extends into the elongated slot of a respective one of said guiding members.

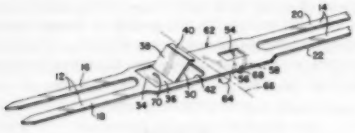


4,425,926

INTEGRAL HAIR CLIP AND METHOD OF MANUFACTURE

John E. Rishton, 3436 Millbury Ave., Baldwin Park, Calif. 91706

Filed Oct. 22, 1981, Ser. No. 313,935
Int. Cl.³ A45D *8/00*
U.S. Cl. 132—46 R **11 Claims**



1. A one piece hair clip formed from a unitary strip of material including:

first hair retaining jaw means;

second hair retaining jaw means facing said first hair retaining jaw means so that hair can be retained therebetween;

spring means connecting said first and second hair retaining jaw means;

a handle portion resiliently connected to said first hair retaining jaw means, said handle portion including:

a first abutment surface; and

a discontinuity formed therethrough; and

a fulcrum post extending from said second hair retaining jaw means, said fulcrum post having:

a second abutment surface thereon elevated from said second hair retaining jaw means positioned to engage said first abutment surface; and

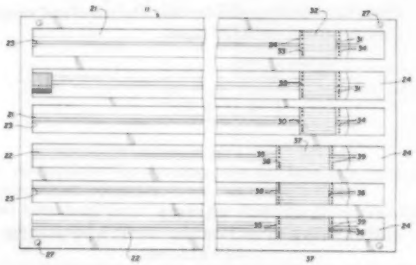
a retainer portion positioned through said discontinuity and formed to retain said first and second abutment surfaces in at least close adjacency.

4,425,927

COIN SORTING AND COUNTING APPARATUS

William J. Smith, 3031 Beauchamp, Dallas, Tex. 75216

Filed Sep. 16, 1982, Ser. No. 418,609
Int. Cl.³ G07D *9/06*
U.S. Cl. 133—8 A **15 Claims**



1. A tray for stacking and counting coins comprising:

a base having at least one elongated trough configured to receive and support a stack of coins; said trough having means defining a base end wall;

said trough being dimensioned to receive and support a stack of coins of a first type having a first diameter, and to alternatively receive and support a stack of coins of a second type having a second smaller diameter;

said trough having a first indicia spaced from its base end wall to identify a stack of a selected number of said first type coins when disposed in said trough, and having a second indicia spaced from its base end wall to identify a stack of a selected number of said second type coins when disposed in said trough;

said indicia for each trough including means defining a first line indicating the length of the shorter associated coin stack, and means defining a second line indicating the length of the longer associated coin stack;

said indicia for each trough further including a line of visible marks paralleling closely each of said indicia lines, and being disposed on the outboard sides of said indicia lines relative to the base end wall of the trough.

4,425,928

LIQUID DISCHARGE APPARATUS

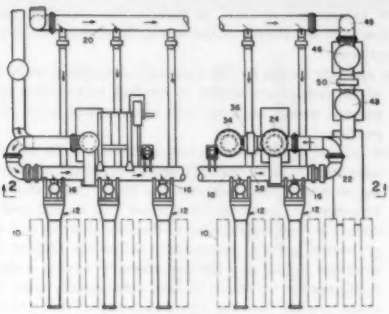
Joseph I. Greenberger, Pittsburgh, and Frederick C. Kohring, Houston, both of Pa., assignors to Wean United, Inc., Pittsburgh, Pa.

Filed Oct. 19, 1981, Ser. No. 312,562
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—122 R **12 Claims**

1. A liquid discharge apparatus comprising a discharge header,

a liquid volume control means arranged to control the volume output of said header, and including at least two

fixedly mounted overflow pipes capable of creating different liquid hydraulic heads, one representing full flow



capacity of said header and the other some fraction of said full flow capacity thereof, and

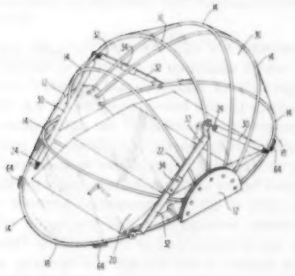
means for selectively operating said overflow pipes.

4,425,929

COLLAPSIBLE STRUCTURE

Horst E. Von Mosshaim, P.O. Box 6641, Newport News, Va. 23606

Filed Mar. 26, 1981, Ser. No. 247,859
Int. Cl.³ A45F *1/16*
U.S. Cl. 135—102 **8 Claims**



1. A collapsible enclosure, comprising:

two central hub flanges having a plurality of joist holes along the periphery thereof;

at least one hub connecting member rigidly but detachably interconnectable between said hub flanges, said hub connecting member defining the width of said enclosure;

a plurality of joist members pivotably mountable between said hub flanges by insertion in said joist holes, the plurality of joist members comprising an inner support joist and a first outer support joist;

a locking mechanism pivotably connecting said inner support joist and said first outer support joist, said locking mechanism having inner and outer legs pivotal on said inner support joist and said first outer support joist respectively, and a locking flange pivotably connecting said inner leg and said outer leg, said legs being pivotable only in one direction;

a spring-like member attachable to and urging together said inner support joist and said first outer support joist;

a second outer support joist and at least one additional locking mechanism and spring-like member for connecting the second outer support joist and said inner support joist;

a covering skin mountable on said joist members and attached thereto at spaced intervals along said skin; and,

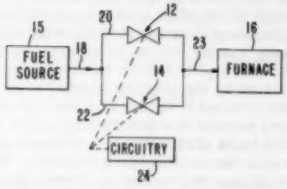
a platform having a channel on a lower side thereof, said channel adapted to overfit said at least one hub connecting member interconnecting said two central hubs, whereby said enclosure is secured by the weight of said platform.

4,425,930

FLUID FLOW CONTROL APPARATUS AND METHOD

Donald Kruto, 431 S. Easy St., Des Plaines, Ill. 60016

Filed May 8, 1981, Ser. No. 261,864
Int. Cl.³ F23N *1/00*
U.S. Cl. 137—1 **25 Claims**



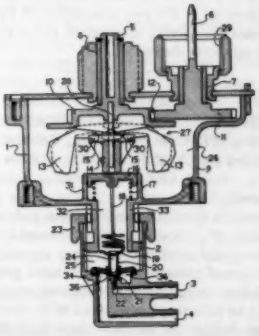
12. A method of controlling the flow of a fluid to a fluid-actuated system the operation of which affects a variable characteristic comprising: allowing the fluid to flow at a first volume rate to the fluid-actuated system when said characteristic is in a first operative condition; reducing the fluid flow to a second volume rate less than said first volume rate at the end of a first time interval; continuing to allow said second volume rate of fluid to flow to said system during a second time interval following the first time interval and until said characteristic is in a second operative condition; if the characteristic remains in the first operative condition until the end of said second time interval, increasing said fluid flow to said first volume rate after said second time interval until the characteristic is in said second operative condition; and stopping said fluid flow to said system when the characteristic is in said second operative condition.

4,425,931

SPEED BIAS FLUID PRESSURE REGULATOR AND SYSTEMS UTILIZING SAME

Andrew A. Kenny, Roselle, and Ronald J. Wojtecki, Naperville, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 1, 1982, Ser. No. 344,898
Int. Cl.³ G05D *16/06*
U.S. Cl. 137—53 **16 Claims**



1. A rotational speed biasing fluid pressure regulation mechanism adapted to provide a fluid pressure signal for use in the control of a fluid pressure controllable device whose function

is desired to be governed by the rotational speed of an object, said mechanism comprising;

a support,

a body member rotatably mounted on the support and having means associated therewith that enables the body member to be rotatably driven in response to the rotation of the object,

a coupling member moveably mounted with respect to the support in such a manner as to be able to move without interfering with the rotation of the body member,

a centrifugal weight assembly secured to the body member and able to rotate therewith in response to the rotation of the object, said assembly having at least one component thereof that biases the coupling member in one direction as a result of the effect of the change in centrifugal force upon the assembly arising from a change in the rotation of the body member caused by a change in the rotational speed of the object, resilient means positioned so as to be compressed by the coupling member when the coupling member is biased in the one direction and able to bias the coupling member in a direction opposite to the one direction as a result of the effect of a change in the centrifugal force upon the assembly that is opposite to the change that biased the coupling member in the one direction,

a fluid pressure regulator positionable with respect to the coupling member, said regulator having a fluid pressure chamber disposed on one side of a resilient diaphragm therewithin that has an inlet port in fluid communication therewith for conveying a supply of fluid pressure thereto that is separated by an orifice from an outlet port in fluid communication therwith for conveying the regulated fluid pressure control signal therefrom, said diaphragm having a vent member secured thereto having an opening thereof that extends through the diaphragm for venting fluid pressure from the chamber in response to movement of the diaphragm by means of a valve member which in response to movement of the diaphragm in one direction is able to seal the vent member opening while opening the orifice so as to decrease the fluid pressure in the chamber for the subsequent conveyance therefrom as the fluid pressure control signal, and in response to movement of the diaphragm in the opposite direction is able to open the vent member while sealing the orifice so as to increase the fluid pressure in the chamber for the subsequent conveyance therefrom as the fluid pressure control signal; and

a linking member for connecting the resilient means to the diaphragm in such a manner that the resilient means is able to impose a force upon the vent member that is counterbalanced by a force imposed thereon by the resilient diaphragm so that the compression of the resilient means by the coupling member reduces the force imposed on the diaphragm by the resilient means so as to allow the force imposed on the vent member by the diaphragm to move the vent member in the one direction and the biasing of the coupling member in the opposite direction by the resilient means causes the linking member to move the vent member in the opposite direction.

4,425,932

SIPHON LADLING APPARATUS

Trent S. Herman, 3273 Countryside Cir., Pontiac, Mich. 48057

Filed Jun. 8, 1981, Ser. No. 271,201

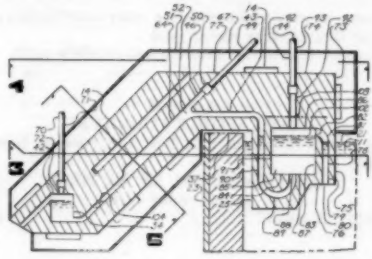
Int. Cl.³ F04F *10/00*

U.S. Cl. 137—143 **10 Claims**

1. In a siphon-like device for intermittent delivery of predetermined amounts of critical liquids on demand from a primary supply reservoir, said device comprising an enclosed hollow body having internal passage means arranged generally in the outline of a siphon including walls defining an upstream passage leg having an inlet portion adapted to be submerged in the reservoir liquid below the surface thereof, walls defining a downstream passage leg disposed outside of the reservoir having an outlet portion terminating substantially below the top horizontal surface of the liquid in the reservoir and walls defining a fluid delivery outlet portion having an outlet and an inlet disposed substantially below the surface of the reservoir liquid forwardly of said downstream passage leg, said legs being joined together in fluid passage relationship at their upper extremeties to form an intermediate elevation passage portion over the surface of the liquid; the improvement which comprises:

air aperture means having upwardly depending walls defining a passage connected in conduit relationship to said passage means adjacent said intermediate level passage portion,

and critical liquid air-lock means having walls defining a substantially large bulbed trap-like holding chamber having its bottom end connected in fluid relationship to the downstream lower outlet portion and its top end connected in fluid relationship to the inner inlet of said delivery outlet portion substantially below the surface of the reservoir liquid, said air-trap chamber having a size and configuration sufficient to hold substantially more liquid when primed than the liquid capacity of that portion of



the downstream leg that extends below the top of said chamber which condition is effective to maintain a substantial quantity of liquid in said chamber to form an air-lock adjacent such lower downstream leg outlet portion by means of the weight of the liquid alone without other mechanical assistance to maintain the prime in the siphon by preventing the liquid level in said chamber from being sucked below said downstream outlet portion which prevents entry of air at atmospheric pressure into said passage means through said delivery outlet when said upstream leg is submerged in the reservoir liquid and a vacuum is applied to the air aperture opening, whereby, after priming, liquid is transferred from said supply reservoir over the intermediate elevation passage portion by pressure of the atmosphere on the reservoir liquid which forces the liquid up the upstream shorter leg while the excess weight of the liquid in the downstream longer leg once filled, causes continuous flow of liquid downstream through said chamber and out said delivery outlet.

4,425,933

LOW DENSITY STOP FLOAT TRAP

Joseph T. Fetsch, Fort Salonga, N.Y., assignor to Hydratron Fuels, Inc., Freeport, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,235

Int. Cl.³ B05G *5/00*

U.S. Cl. 137—172 **11 Claims**

1. An apparatus for preventing contamination of the environment by a stored organic liquid, said organic liquid having a predetermined specific gravity, said apparatus comprising:

a tank for containing said organic liquid;

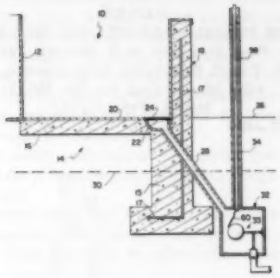
a liquid impervious containment structure surrounding said tank;

a drain opening formed in said structure;

drain valve means connected to said drain opening for distinguishing between said organic liquid and liquid having a greater specific gravity than said organic liquid, and pass-

ing said liquid having a greater specific gravity from said containment structure;

wherein said drain valve means comprises a trap including a float actuated valve, said float actuated valve including a



float member having a specific gravity less than water but greater than said stored organic liquid; and

manual actuation means for manually actuating said float actuated valve.

4,425,934

HEAD OF AN AIR PUMP FOR INFLATING PNEUMATIC TIRES HAVING A MOTORCYCLE VALVE

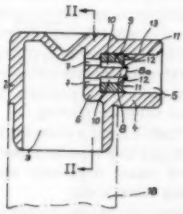
Walter Scheffer, Sundern, Fed. Rep. of Germany, assignor to Scheffer-Klute GmbH & Co., Sundern, Fed. Rep. of Germany

Filed Jun. 16, 1981, Ser. No. 274,094

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3035036

Int. Cl.³ F16K *15/20*

U.S. Cl. 137—223 **6 Claims**



1. A head of an air pump for inflating pneumatic tires having a Schrader valve, said head comprising

(a) a housing (2) defining a pressure space (3) and arranged to be connected to an air pump (18) defining a piston space so that the pressure space (3) and the piston space are in communication with one another;

(b)a tubular projection (4) formed integral with the housing and defining a cavity (5) appliable upon a Schrader valve (1) including a valve body (14) and a spring-biased check valve (17);

(c) a partition (6) between the cavity and the pressure space, the cavity of the projection communicating by at least one air duct (7) passing through the partition with the pressure space, and (d) a check valve provided in the cavity of the projection and defined by an annular seal (9) composed of a resilient material selected from the group consisting of rubber and plastic and arranged around a stationary lifting pin (8) projecting from the partition into the cavity of the projection and leaving free between itself and the lifting pin an annular connecting duct (10), said resilient annular seal comprising a flexible annular sealing lip (12) integrally formed to said annular seal and projecting inwardly, across said annular connecting duct and with the free annular edge of said sealing lip in sealing engagement with the exterior surface of said lifting pin and adapted to permit flow of air through said annular connecting duct from said air duct but prevent flow of air through said annular connecting duct towards said air duct, said seal forming with its free annular edge a sealing surface (11) for facially engaging the Schrader valve body (14) and said lifting pin forming with its free end an end face for engaging and depressing said spring-biased check valve of said Schrader valve, whereby, said resilient annular seal with said flexible annular sealing lip serving both as a seal when said tubular projection is applied to said Schrader valve and, in cooperation with said lifting pin, as a one-way valve permitting air flow through said annular connecting duct into said Schrader valve but preventing air flow from said Schrader valve through said annular connecting duct.

4,425,935

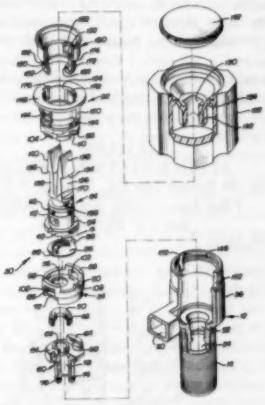
SNAP IN VALVE CARTRIDGE FOR PLUMBING FIXTURE

Teodoro J. Gonzalez, Mission Hills, Calif., assignor to Price Pfister, Inc., Pacoima, Calif.

Filed May 19, 1982, Ser. No. 379,931

Int. Cl.³ F16K *43/00*

U.S. Cl. 137—315 **21 Claims**



1. A valve structure for a plumbing fixture or the like:

(a) a fixture body having a chamber and walls on opposite sides of the chamber, one of said walls providing a cup and the other of said walls providing an inlet, said cup having an internal annular groove;

(b) a valve cartridge cooperable with said fixture body;

(c) said cartridge including a hollow cage made of semi-rigid resilient material, said cage having at least two spring members formed in its side walls normally projecting outwardly to latch said internal groove of said cup axially to locate said cartridge in said fixture body;

(d) said spring members and said annular groove having engaging surfaces with a cam or ramp configuration to flex the spring members inwardly upon the application of outward pressure on the cage;

(e) said cartridge including a part mating with said inlet opening;

(f) valve port and valve closure means carried by the cartridge;

(g) a stem for said closure means, and having an end accessible at said valve cup; and

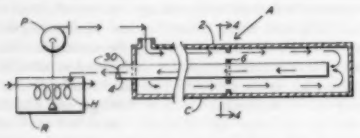
(h) a removable locking member fitting inside the cage to block inward movement of said spring members.

4,425,936

CONCENTRIC TUBE HEAT TRACING APPARATUS

David C. Goss, San Marcos, Tex., assignor to Thermon Manufacturing Company, San Marcos, Tex.

Filed Aug. 2, 1982, Ser. No. 404,432
Int. Cl.³ F16L *53/00*
U.S. Cl. 137—340 **8 Claims**



1. A heat transfer tracing line in combination with a pipeline comprising:

reservoir means for containing a quantity of heat transfer fluid;

means with said reservoir means for controlling the temperature of the heat transfer fluid in said reservoir means;

said tracing line being formed of a self-contained, loop conduit means having an inner conduit and an outer conduit, said conduit means having an inlet and an outlet, said inlet and said outlet being in fluid communication with said reservoir means;

pump means associated with said reservoir means to circulate the heat transfer fluid from said reservoir means through said conduit means and back to said reservoir means; and

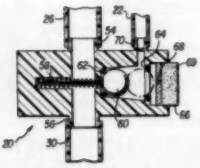
wherein said conduit means is mounted in heat exchanging relationship to the exterior of said pipeline.

4,425,937

FLUID INJECTION SYSTEM

Myron Stein, 79 Robert Pitt Dr., Monsey, N.Y. 10952

Filed Jun. 2, 1981, Ser. No. 269,677
Int. Cl.³ F02B *77/04*
U.S. Cl. 137—480 **6 Claims**



1. A valve comprising:

an outlet passage being adapted to be connected to a source of vacuum in an intake manifold of said engine;

a first inlet passage adapted to be connected to a supply of antidetonant fluid;

a second inlet passage having an air filter for the purpose of allowing the entry of filtered air therein;

a third inlet passage adapted to be connected to a PCV valve;

a fluid mixing chamber into which antidetonant fluid and filter air flows;

a moveable fluid mixing control means located in said fluid mixing chamber;

a biasing means operatively associated with said fluid mixing control means for moving said fluid mixing control means at predetermined vacuum conditions;

said moveable fluid mixing control means having a first position in said fluid mixing chamber wherein no antidetonant fluid nor filtered air can flow through said outlet passage;

said moveable fluid mixing control means having a plurality of positions other than said first position wherein a mixture of antidetonant fluid and filtered air is allowed to pass through said outlet passage, said mixture having different ratios of antidetonant fluid to filtered air;

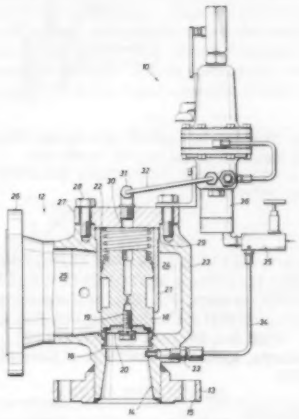
and said third inlet passage being in continuous fluid communication with said outlet passage.

4,425,938

LOW PRESSURE SAFETY RELIEF VALVE

Donald M. Papa, P.O. Box 1475, Bellaire, Tex. 77401, and Walter W. Powell, 8914 Valley View, Houston, Tex. 77074

Filed Mar. 5, 1982, Ser. No. 355,131
Int. Cl.³ F16K *31/363*
U.S. Cl. 137—489 **14 Claims**



1. A pilot valve for control of a low pressure safety relief valve which safety relief valve is exposed to an inlet pressure wherein the inlet pressure is selectively relieved by operation of the safety relief valve and wherein the pilot valve controls the safety relief valve by selectively applying control pressure to the safety relief valve to close the safety relief valve and, by selectively reducing the control pressure, to open the safety relief valve, the pilot valve comprising:

(a) a pilot valve body having a chamber therein;

(b) a valve seat in said valve body chamber;

(c) movable valve means selectively closing against said valve seat in said valve body;

(d) diaphragm means having two pressure isolated sides in a chamber in said valve body;

(e) first means for introducing fluid through an inlet at inlet pressure of the safety relief valve, said first means placing pressure on one side of said diaphragm means to form a force acting on said diaphragm means;

(f) second means forming an intermediate pressure less than the inlet pressure and introducing fluid at the intermediate pressure against the second side of said diaphragm means;

(g) wherein said first means and second means form forces selectively moving said diaphragm means on achieving a specified differential force;

(h) second diaphragm means having two pressure isolated sides received in a chamber in said valve body;

(i) third means exposing one side of said second diaphragm means to fluid at a pressure between atmospheric pressure and inlet pressure to form a force acting on said second diaphragm means;

(j) an adjustable resilient means opposing said diaphragm means and said second diahragm means;

(k) valve stem means connected to said valve means for opening said valve means relative to said valve seat, said valve stem means being operatively coupled to and moved

by forces from said adjustable resilient means, diaphragm means and second diaphragm means;

(l) passage means supplied with inlet pressure and extending to said valve seat and valve means, said passage means additionally connecting with an outlet line from said pilot valve extending to the safety relief valve to conduct control pressure to the safety relief valve for control of opening and closing of said safety relief valve;

(m) an exhaust passage from said valve seat and said valve means normally closed by said valve means for selectively dropping pressure in said outlet line by opening a flow path through said exhaust passage;

(n) orifice means upstream of said outlet line forming a pressure drop dependent on fluid flow through said orifice means; and

(o) said orifice means and said valve seat and valve means modifying the control pressure applied to the safety relief valve to open and close the safety relief valve.

4,425,939

VALVE FOR ADJUSTING THE CLOSING SPEED OF A DOOR CLOSER

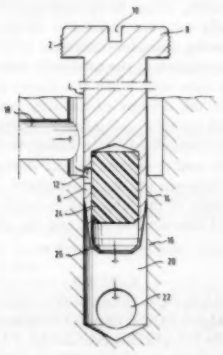
Mario Marinoni, and Mirko Marinoni, both of Magenta, Italy, assignors to Casma di V. Marinoni & Figli, Magenta, Italy

Filed Dec. 8, 1981, Ser. No. 328,509

Claims priority, application Fed. Rep. of Germany, May 5, 1981, 3117730

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—599.2 **6 Claims**



1. A valve for adjusting the closing speed of a door closer, comprising an axially extending, generally cylindrical valve member having a tubular portion and a solid portion following one another in axial direction, the end of said tubular portion facing away from said solid portion being open and the wall of said tubular portion extending in the axial direction of said valve member, said wall having an opening spaced axially from said open end of said tubular portion, a valve body defining a blind-end bore, said valve member being axially adjustable in said bore with sliding contact between said wall and the surface of said bore, the open end of said tubular portion facing the end of said blind-end bore, said valve body including inlet and outlet conduits opening into said bore, said inlet conduit and said opening being located so as to be positionable into communication in such a way that an axial adjustment of said valve member changes the cross-sectional area of the passage created between said inlet conduit and said opening, wherein the improvement comprises a body of elastic foam material arranged in the interior of said tubular portion and placed across said opening.

4,425,940

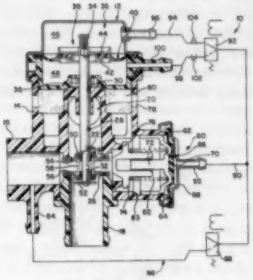
PRESSURE CONTROL SYSTEM

John E. Cook, Chatham, Canada, assignor to Canadian Fram Limited, Canada

Filed Apr. 2, 1981, Ser. No. 250,340

Int. Cl.³ F16K *11/14*

U.S. Cl. 137—627.5 **5 Claims**



3. In a pressure control system a housing having an inlet communicated to a fluid pressure source providing a pressure level greater than atmospheric pressure and a pair of outlets, primary valve means controlling communication between said inlet and said outlets, said primary valve means including a pressure differential diaphragm means for actuating said primary valve means from a first condition in which said primary valve means closes one of said outlets and communicates the other of said outlets to said inlet, said primary valve means being actuated to a second condition in which said primary valve means closes said other of said outlets and opens the one outlet to said inlet, said system including a pressure tap for generating a pressure signal from the pressure level communicated to said inlet from said pressure source, conduit means including a pair of branches for communicating said pressure signal from said tap to opposite sides of said pressure differential responsive diaphragm means, and electrically actuated valve means controlling communication through said branches to cause said diaphragm means to actuate said primary valve means between first and second conditions and wherein said primary valve means is actuable to a third condition in which communication from said inlet to both of said outlets is prevented, and an electrically actuated valve mechanism in said conduit between said tap and said electrically actuated valve means, said electrically actuated valve mechanism being actuable from a normal condition in which said conduit and both of said branches is vented to atmosphere to thereby communicate said opposite sides of said pressure differential diaphragm means to atmospheric pressure to an actuated position permitting said electrically actuated valve means to communicate one of said branches with said tap.

4,425,941

VALVE CONSTRUCTION HAVING MULTIPLE PISTON MEANS AND METHOD OF MAKING THE SAME

Marvin P. Weaver, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 126,836, Mar. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 911,403, Jun. 1, 1978, Pat. No. 4,228,817. This application Jun. 12, 1981, Ser. No. 273,220

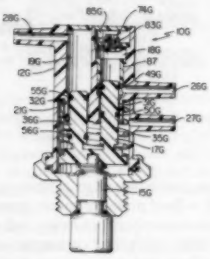
The portion of the term of this patent subsequent to Oct. 21, 1997, has been disclaimed.

Int. Cl.³ F16K *11/04*

U.S. Cl. 137—871 **5 Claims**

1. In a valve construction having a housing means provided with a chamber and port means leading to said chamber and having an axially movable piston means disposed in said chamber to interconnect certain of said port means together in

relation to the axial position of said piston means that is caused by a condition reponsive device and a spring means operatively associated with said piston means, the improvement wherein said piston means comprises a plurality of pistons disposed in spaced substantially parallel relation and being secured together to be axially moved in unison in said chamber under the influence of said condition responsive device, said spring means comprising a single coiled compression spring telescopically receiving said pistons therein, said port means comprising first, second and third port means leading to said chamber, said piston means comprising first and second pistons, said chamber having first and second sections respectively receiving part of said first and second pistons therein,



said first and second sections respectively having said first and second port means interconnecting therewith whereby each piston part controls the port means of its respective section independently of the other piston, said chamber having a third section thereof that is disposed in communication with said first and second sections and receiving the remaining parts of said pistons therein, said third port means interconnecting with said third section of said chamber in all positions of said pistons in said chamber, said housing means having first and second valve seat means respectively in said first and second sections and respectively intermediate said third port means and said first and second port means, said first and second pistons respectively controlling said first and second valve seat means.

4,425,942

FINNED TUBE FOR A HEAT EXCHANGER

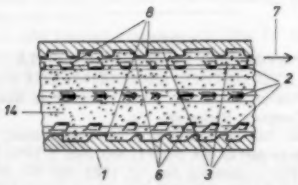
Manfred Hage, Ulm-Wiblingen, and Gerhard Schinköth, Neu-Ulm/Pfuhl, both of Fed. Rep. of Germany, assignors to Wieland-Werke A.G., Ulm, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,756

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048959

Int. Cl.³ F15D *1/06*

U.S. Cl. 138—38 **6 Claims**



1. A finned tube for a heat exchanger comprising a drawn tube having an outer surface and an inner surface with torn raised portions provided on said inner surface which torn raised portions are arranged in a plurality of rows extending in a longitudinal direction of the drawn tube and which possess lateral surfaces which also extend in the longitudinal direction of the drawn tube and are longer than the width of of the torn raised portions, said torn raised portions being arranged, within each row, at irregular intervals.

4,425,943

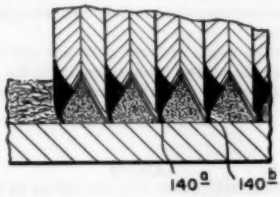
PLUG ASSEMBLY FOR USE IN METHOD AND APPARATUS FOR REPAIRING HEAT EXCHANGERS

John E. Martin, Penllyn Pike, Spring House, Pa. 19477

Continuation-in-part of Ser. No. 214,189, Dec. 8, 1980, Pat. No. 4,393,564. This application Oct. 16, 1981, Ser. No. 311,912

Int. Cl.³ B65D *39/12*

U.S. Cl. 138—89 **6 Claims**



1. For use in plugging a tube which may have foreign matter on its inner periphery, a plug assembly comprising a tubular sleeve and a wedge slidable axially inside the sleeve for expanding the sleeve radially outward against the interior of the tube, a plurality of deformable cutting edges extending circumferentially about the outer periphery of said tubular sleeve and a plurality of grooves disposed between said cutting edges, each of said cutting edges being defined by surfaces which converge radially outward to form a substantially V-shaped cross-section having a slender outermost tip portion capable of being deformed relative to the tube wall without substantially penetrating the tube wall when the sleeve is forced radially outward against the interior of the tube, said cutting edges cooperating with the tube wall when said wedge is forced into said sleeve to penetrate the foreign matter, to displace the same into the grooves, and to deform for providing a labyrinth-like fluid-tight seal between the outer periphery of the sleeve and the inner periphery of the tube wall, whereby a leak resistant joint is provided between the tube and the plug assembly.

4,425,944

REPAIR PLUG FOR HEAT EXCHANGER TUBES, ESPECIALLY FOR STEAM GENERATORS OF PRESSURIZED-WEATHER NUCLEAR POWER PLANTS

Frederik E. Heuckelbach, Heinkenszand, Netherlands; Robert Weber, Uttenreuth, and Jakob Weber, Erlangen, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Nov. 13, 1981, Ser. No. 320,869

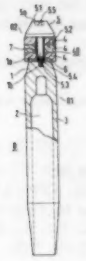
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1980, 3043343; Sep. 7, 1981, 3135382

Int. Cl.³ F16L *55/10, 55/12*

U.S. Cl. 138—89 **4 Claims**

1. Repair plug for sealing heat exchanger tubes, comprising a closure plug part being tightly connectable to a heat exchanger tube and having an end for insertion into the heat exchanger tube, and a polisher plug part disposed on said insertion end of said closure plug part axially in front of said insertion end in insertion direction thereof forming a single structural unit with said closure plug part, said polisher plug part remaining in the sealed heat exchanger tube after completing the tight connection, said insertion end of said closure plug part having a surface formed thereon, and said polisher plug part being in the form of a felt polisher disk packet, a clamping bolt, at least part of which being centrally disposed in said packet and anchored in said closure plug part holding said

packet against said insertion end surface, and a sleeve in which said clamping bolt is disposed, said felt disks being stacked on



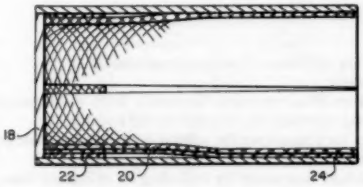
said sleeve and having central bores formed therein in which said sleeve is disposed.

4,425,945

THREAD GUARD

Ronald T. McDonald, 410 Santa Dominga, Solana Beach, Calif. 92075

Filed Sep. 29, 1982, Ser. No. 426,621
Int. Cl.³ B65D *59/06*
U.S. Cl. 138—96 T **11 Claims**



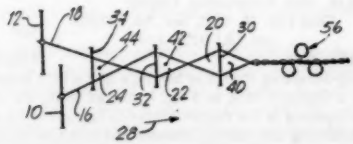
1. A protective cap for threaded pipe comprising:
a tubular housing having closed end and open end for fitting over threaded end of pipe;
a tubular lining in said housing extend substantially the length thereof; and
an elastic ring disposed between said liner and the wall of said tubular housing for biasing said liner into frictional gripping engagement with the end of a pipe.

4,425,946

WEAVING METHOD AND APPARATUS

Thomas F. McGinley, Phillipsburg, N.J., assignor to McGinley Mills, Inc., Phillipsburg, N.J., a part interest

Filed Oct. 16, 1980, Ser. No. 197,523
Int. Cl.³ D03D *47/00*
U.S. Cl. 139—11 **63 Claims**



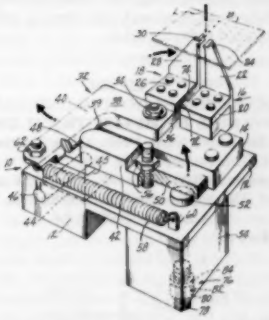
1. In a method of weaving including the steps of forming sheds of warp threads successively at a first location on a loom, continuously moving said sheds away from said first location and toward a second location spaced a distance from said first location such that said sheds move in a direction generally parallel to said warp threads, retaining a plurality of said sheds during the continuous movement of said sheds from said first location toward said second location, and inserting weft threads into said retained sheds during the continuous movement of said retained sheds from said first location toward said second location such that each of said retained sheds has a weft thread inserted thereinto; the improvement comprising the further steps of retaining said sheds by inserting shed-retaining means into each of said sheds, using said shed-retaining means to form a plurality of continuous substantially closed channels, each channel being formed in a corresponding one of said retained sheds, inserting said weft threads into said channels formed by said shed-retaining means using a plurality of fluid jets, each fluid jet being substantially constrained within a corresponding one of said channels by an associated shed-retaining means during the insertion of a respective weft thread and each weft thread being substantially constrained with a corresponding one of said channels by an associated shed-retaining means until its respective retained shed is released, moving said fluid jets alongside said retained sheds such that said fluid jets move in generally the same direction as said retained sheds during the insertion of said weft threads, and synchronizing the movement of said fluid jets with said retained sheds such that each fluid jet moves conjointly with a corresponding one of said retained sheds during the insertion of a respective weft thread, whereby a predetermined number of said weft threads can be inserted substantially simultaneously into a corresponding number of said retained sheds.

4,425,947

SINGLE POINT CUT AND CLENCH MECHANISM

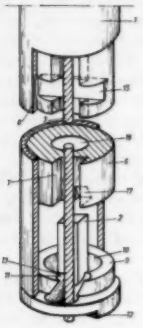
Richard B. Maxner, and Vitaly Bandura, both of Danvers, Mass., assignors to USM Corporation, Farmington, Conn.

Filed Nov. 3, 1981, Ser. No. 317,749
Int. Cl.³ B21F *1/00*
U.S. Cl. 140—105 **4 Claims**



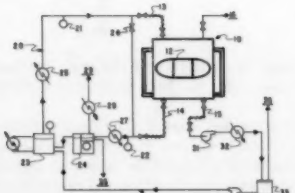
1. A mechanism for cutting and clinching the lead of an electrical component that has been inserted in a circuit board comprising:
a. a base support means adapted to be fixed to means coacting with a circuit board carrier to place the mechanism in a predetermined position for the cut-clinch operation;
b. a cutting and clinching head having movable and fixed cut-clinch portions carried on the support means;
c. said movable portion having a cut-clinch portion on one end and a cam surface on the opposite end, said movable portion being pivotally carried on the support means intermediate its ends and pivoted to a closed head position in response to a cam actuator pivotally carried on the support means.

4,425,948
WIRE WRAPPING TOOL
Eric Sterner, Hägersten, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Dec. 7, 1981, Ser. No. 328,389
Claims priority, application Sweden, Dec. 22, 1980, 8009061
Int. Cl.³ B21F 7/00
U.S. Cl. 140—119 **4 Claims**



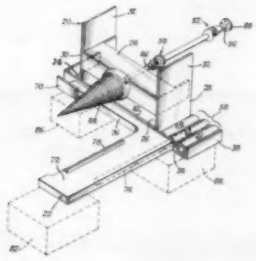
1. A wire wrapping tool comprising a cylindrical wrapping bit adapted for longitudinally receiving a tag on which a wire is to be wound, said bit having a longitudinal groove offset from the tag for receiving a wire such that upon relative rotation of the bit and tag the wire is wound around the tag, said bit including a nozzle member freely rotatably relative to the bit, said nozzle member having a hole for receiving the wire extending from said groove, said hole in a particular relative angular position of said bit and nozzle member being in prolongation of said groove, said hole being inclined relative to said groove to provide offset edges for said hole which frictionally engage a free end of the wire in said hole to hold said free end when the wire is wound by the bit around the tag for a given member of turns whereas upon subsequent rotation of the nozzle member relative to said bit in the opposite direction the free end of the wire is wound onto the tag and the tool becomes disengaged from the wire.

4,425,949
PROCESS FOR REMOVING UNDESIRABLE SUBSTANCES FROM ELECTRICAL DEVICES
Edward A. Rowe, Jr., North Perry, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.
Continuation-in-part of Ser. No. 231,137, Feb. 3, 1981, abandoned. This application Feb. 1, 1982, Ser. No. 344,560
Int. Cl.³ B65B 3/04
U.S. Cl. 141—1 **12 Claims**



1. A method for retrofilling a transformer which contains polychlorinated biphenyls and other undesirable substances comprising:
(A) evacuating said transformer to about one millimeter Hg;
(B) introducing a halogenated aliphatic hydrocarbon vapor into said transformer removing that vapor which is not adsorbed or condensed by the transformer, such that PCBs are removed along with said vapor until the outlet vapor temperature equals the inlet vapor temperature;
(C) discontinuing introduction of said halogenated aliphatic hydrocarbon;
(D) evacuating said transformer to about 20 millimeters Hg; and
(E) filling said evacuated transformer with a dielectric material.

4,425,950
LOG SPLITTING APPARATUS
Eugene L. Schnebly, 18508 Road 14, Fredericktown, Ohio 43019
Filed Aug. 6, 1982, Ser. No. 406,114
Int. Cl.³ B27L 7/00
U.S. Cl. 144—194 **6 Claims**

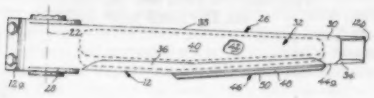


1. A log splitting apparatus comprising:
a housing;
a splitter cone extending forwardly from the housing and being journaled for rotation in the housing;
means for connecting the splitter cone to a rotatable power source;
a stabilizer base assembly including an elongated base plate extending forwardly from one side of the housing in position to engage a log being pierced by the splitter cone to thereby enable the base plate to absorb torque reaction from the log at said one side of the housing, the base plate having a pivotal connection to the housing about an axis extending substantially parallel to the axis of the splitter cone, a torque arm extending transversely from the base plate to the other side of the housing; and
a support member connected to said other side of the housing in position to engage the end portion of the torque arm remote from the base plate to thereby absorb additional torque reaction from the log at the other side of said housing.

4,425,951
HOLLOW DEBARKING ARM
Ronald D. Pousette, Vancouver, and John L. Sanders, North Vancouver, both of Canada, assignors to Brunette Machine Works, Ltd., New Westminster, Canada
Filed Feb. 16, 1982, Ser. No. 349,046
Int. Cl.³ B27L 1/00
U.S. Cl. 144—208 E **4 Claims**

1. In a log-debarking apparatus having a ring which is rotatable about a transport axis, as a log is moved along the axis through an opening in the ring in a front-to-rear direction, an elongate debarking arm having an outer end mounted on said ring for swinging of its inner, bladed and toward and away from said axis, said arm comprising
a substantially closed hollow section extending between and joining said ends, said section having a front edge portion which inclines rearwardly progressing toward the inner

end of the section, and a front wall portion which slopes rearwardly progressing from said edge portion in a direction away from said transport axis, and



a curved log-engaging edge projection extending along and projecting forwardly from said edge portion.

4,425,952

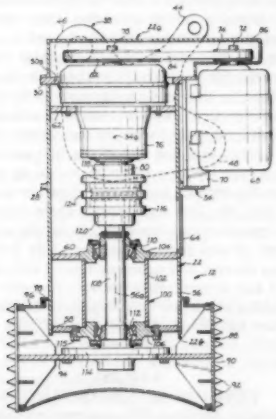
LOG-FEED APPARATUS

Ronald D. Pousette, Vancouver, and John L. Sanders, North Vancouver, both of Canada, assignors to Brunette Machine Works Ltd., New Westminster, Canada

Filed Feb. 16, 1982, Ser. No. 348,994

Int. Cl.³ F16D 3/64; B27L 1/00

U.S. Cl. 144—246 F **4 Claims**



1. In a log-feed assembly having a frame defining a transport axis for a log, log-feed apparatus comprising

an elongated arm, having ends, pivoted on said frame for swinging of one of said ends toward and away from said transport axis,

power-operated drive means mounted on said arm adjacent the other end thereof,

a speed reducer mounted on said arm intermediate its said ends,

belt drive means operatively interconnecting the output of said power-operated means and the input of said reducer,

a log-engaging feed roll, and journaling means journaling said roll on said arm adjacent the arm's said one end, and

rotary coupling means operatively coupling the output of said speed reducer to said feed roll,

said journaling means substantially isolating said rotary coupling means and said speed reducer from all but torsional loads transmitted by said feed roll.

4,425,953

PNEUMATIC VEHICLE TIRE HAVING A RUBBER LAYER BETWEEN BELT PLIES

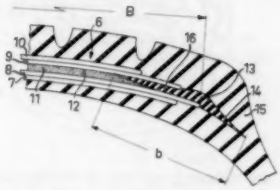
Dieter Rohde, Lehrte, and Siegfried Preatorius, Barsinghausen, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Feb. 9, 1982, Ser. No. 347,254

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105209

Int. Cl.³ B60C 9/20

U.S. Cl. 152—360 **14 Claims**



1. A pneumatic vehicle tire comprised primarily of elastomeric material and having a radial carcass, sidewalls, a tread, and a pull resistant belt having edges associated therewith and being located between said carcass and said tread, said belt extending approximately over the width of said tread and including at least two cord fabric plies, the cords of which have a given diameter; said tire further comprising a rubber layer arranged at least partially between two of said plies and having a thickness of from said given cord diameter to 5 mm, said rubber layer being free of any reinforcing cords and including a central strip located entirely between said two belt plies, and two side strips having a predetermined hardness and having a radially inner side thereof respectively, one on each side of and adjoining said central strip, said side strips respectively having a width relative to said belt and projecting partially laterally beyond the associated edges of said belt, the projecting portion of said side strips having a width that is approximately 10% of the belt width, said central strip of said rubber layer being considerably softer than said side strips thereof.

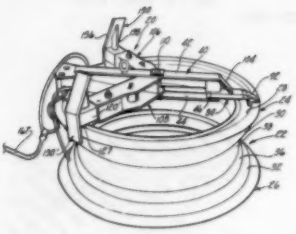
2. A pneumatic vehicle tire comprised primarily of elastomeric material and having a radial carcass, sidewalls including portions having rubber layers adjacent to side strips, as herein defined, a tread, and a pull resistant belt having edges associated therewith and being located between said carcass and said tread, said belt extending approximately over the width of said tread and including at least two cord fabric plies radially superimposed upon one another, the cords of which have a given diameter; said tire further comprising a rubber layer arranged at least partially between two of said plies and having a thickness of from said given cord diameter to 5 mm, said rubber layer including a central strip located entirely between said two belt plies, and two side strips having a predetermined hardness and having a radially inner side thereof respectively, one on each side of and adjoining said central strip, said side strips respectively having a width relative to said belt and projecting partially laterally beyond the associated edges of said belt, said central strip of said rubber layer being considerably softer than said side strips thereof, approximately half of the width of each of said side strips of said rubber layer being arranged as a portion with a thickness between said two belt plies, with the other half of the width of each of said side strips as a portion with a thickness projecting laterally beyond the associated edges of said belt.

4,425,954

METHOD AND APPARATUS FOR MOUNTING TIRES ON RIMS

Robert S. Ogren, Owatonna, Minn., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Apr. 20, 1981, Ser. No. 255,786
Int. Cl.³ B60C 25/08
U.S. Cl. 157—1.22 13 Claims



1. In a tire mounting machine of the type which mounts a tire casing having two axially spaced beads onto a wheel rim having first and second axially spaced tire-bead-retaining circumferential flanges and at least one re-entrant surface means protruding radially inwardly of the rim and extending circumferentially therearound adjacent said first rim flange, annular bead seating areas axially inwardly adjacent to said flanges, and a sloping-walled drop center portion therebetween, the machine being of the type in which two counter-rotating bead deflector shoes are rotated adjacent one side of the rim and about such first flange, so as to commence travel adjacent to each other and then rotate through nearly semi-circular arcs of travel in an opposite sense with one of the two tire beads closest to the rim disposed at least partially in the drop center portion, the improvement for mounting the one tire bead over the rim first flange comprising:

(a) means for orienting said machine and rim with said bead deflector shoes in a retracted position generally adjacent to each other at a selected point along the circumference of the first rim flange in the vicinity of said portion of said one tire bead disposed in said rim drop center portion;

(b) means for counter-rotating said bead deflector shoes to slidably engage said one tire bead to stretch the same along the first rim flange in an arc widening progressively from said selected point during substantially the first one-third of their said arcs of travel and then to deflect said bead over the first rim flange during substantially the second two-thirds of their said arcs of travel to thereby complete the one bead deflection over the first flange of the rim, said shoe counter-rotating means comprising two counter-rotating arms with said bead deflector shoes individually supported thereon, and wherein said arms are mounted to counter-rotate about a common pivot point;

(c) holding means operably engaging said rim re-entrant surface for holding said tire mounting machine fixed against movement axially relative to said rim while permitting said machine to rotate bodily generally about the axis of the rim; and

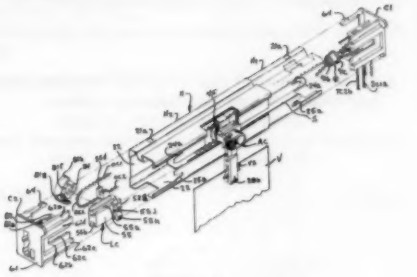
(d) means for powering said shoe counter-rotating means operable to apply substantially equal forces thereto during said shoe travel whereby said machine is pivotable relative to the rim in response to unequal reaction forces exerted by the tire beads on said shoes during their said arcs of travel, said powering means comprising a pair of rams individually propelling each shoe and hydraulic pressure fluid supply means operable to power said rams with equalized hydraulic pressure such that said rams are extensible independently of one another in accordance with the tire bead reaction forces exerted respectively thereagainst via the associated bead deflector shoe.

4,425,955

VERTICAL BLIND MECHANISM

Edward M. Kaucic, Middleton, Wis., assignor to Graber Industries, Inc., Middleton, Wis.

Filed May 17, 1982, Ser. No. 378,759
Int. Cl.³ E06B 9/30
U.S. Cl. 160—168 R 25 Claims



1. A vertical blind mechanism comprising a horizontal rod having a lengthwise extending slot and track means along said slot, a plurality of auxiliary carriers mounted on the track means for movement along the rod and extending through the slot, a vane support mounted on each auxiliary carrier for turning about an upright axis, a sprocket mounted for axial rotation on each auxiliary carrier inside the rod, drive means connecting each sprocket to the associated vane support for turning the latter, a flexible operating chain having first and second chain portions inside the rod adapted to extend lengthwise of the rod, first and second chain guide means on each auxiliary carrier for respectively retaining the first and second chain portions in meshing engagement with the associated sprocket at diametrically opposite sides thereof, traverse means associated with one end of said first and second chain portions operable to move said one end of the first and second chain portions in a first direction along the rod to an extended position to draw the said first and second chain portions lengthwise along the rod, the first and second chain portions limiting maximum separation between adjacent auxiliary carriers when said one end of said first and second chain portions are extended along the rod, and means associated with the other ends of said first and second chain portions operable to move the first and second chain portions lengthwise in relatively opposite directions for rotating the sprockets to turn the vanes.

4,425,956

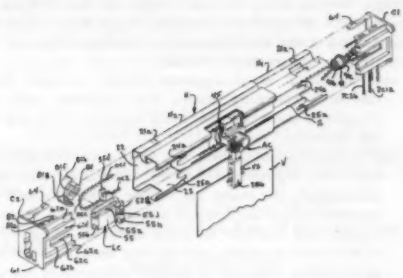
VERTICAL BLIND MECHANISM

Mark J. Terlecke, Madison, Wis., assignor to Graber Industries, Inc., Middleton, Wis.

Filed May 20, 1982, Ser. No. 380,033
Int. Cl.³ E06B 9/30
U.S. Cl. 160—168 R 8 Claims

1. In a vertical blind mechanism comprising, a rod having lengthwise extending track means, a lead carrier and a plurality of auxiliary carriers mounted on the track means for movement along the rod, a vane support mounted on each auxiliary carrier for turning about an upright axis, a sprocket means mounted for axial rotation on each vane carrier and drive means connecting each sprocket means to the associated vane support for turning the latter, chain return means on said lead carrier, a flexible chain looped intermediate its ends around the chain return means and having first and second chain portions extending from the chain return means lengthwise of the rod toward one end of the latter, first and second chain guide means on each auxiliary carrier for respectively retaining the first and second chain portions in meshing engagement with the associated sprocket at diametrically opposite sides thereof,

traverse means connected to the lead carrier operable to move the lead carrier along the rod between a retracted position adjacent said one end of the rod and an extended position spaced along the rod from said retracted position, means for releasably retaining the lead carrier in its extended position with the first and second chain portions drawn lengthwise of the rod, the first and second chain portions limiting maximum separation between the carriers when the lead carrier is moved in one direction along the rod away from said one end to said extended position, and chain operation means associated with the ends of said first and second chain portions operable to relatively move said first and second chain portions lengthwise in relatively opposite directions for rotating the sprockets to



turn the vanes, the improvement comprising a chain locking device inside the rod at a location in the path of movement of the sprocket on one of the auxiliary carriers when it is retracted toward said one end of the rod, the chain locking device having chain guide passage means therein for guidably engaging the first and second chain portions for movement in relatively opposite directions therethrough, the chain guide passage means maintaining the first and second chain portions passing therethrough spaced apart a distance substantially less than the pitch diameter of the sprocket on said one auxiliary carrier to lock the first and second chain portions to the sprocket on said one auxiliary carrier when it is retracted into engagement with said chain locking device.

4,425,957

METERING FUEL SUPPLY TO A SAND PACKING COMBUSTION CHAMBER

Kurt Fischer, Schaffhausen, and Franz Mueller, Neuhausen am Rheinfall, both of Switzerland, assignors to George Fischer Aktiengesellschaft, Switzerland

Filed Jan. 20, 1982, Ser. No. 341,011

Claims priority, application Switzerland, Jan. 23, 1981, 435/81

Int. Cl.³ B22C *15/00*

U.S. Cl. 164—37 **15 Claims**

1. A method for supplying an accurately predetermined quantity of a fuel, or a mixture of fuels, to a combustion chamber forming part of an apparatus for producing foundry molds of the type wherein a quantity of molding sand to be compacted has a surface exposed to the combustion chamber, the method comprising the steps of

providing a dosing container having a predetermined interior volume which is separated from the combustion chamber,

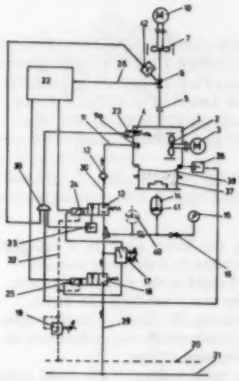
filling the dosing container with fuel or mixture of fuels under pressures until the pressure therein reaches a predetermined level above the level of pressure in the combustion chamber,

conducting the fuel from the dosing container into the combustion chamber until the pressure in the dosing container falls to a predetermined lower pressure level and igniting the fuel in the chamber to create an exothermic reaction.

9. An apparatus for producing foundry sand molds of the type comprising a molding chamber containing sand to be compacted to form a mold, the sand having an exposed upper surface, a combustion chamber coupled to the molding chamber for receiving fuels to be reacted to compact the sand, and means for supplying fuel to said combustion chamber, comprising the combination of:

a source of fuel at a pressure greater than the normal pressure of the combustion chamber;

supply conduit means for delivering fuel from said source to said combustion chamber;



a dosing container coupled to said supply conduit means;

valve means for selectively connecting said dosing container to said supply conduit means during a filling phase for filling said dosing container with fuel and to said combustion chamber during a loading phase for loading fuel from said dosing container into said combustion chamber;

pressure sensing means coupled to said container responsive to upper and lower fuel pressures therein, respectively, for activating said valve means to terminate said filling phase at said upper pressure and said loading phase at said lower pressure.

4,425,958

LOW-PRESSURE CASTING METHOD AND LOW-PRESSURE CASTING APPARATUS

Hans Läthy, Buchs; Eugen Isler, Niederrohrdorf; Ewald Meier, Unterehrendingen, and Max Zimmermann, Niederrohrdorf, all of Switzerland, assignors to Egro AG, Niederrohrdorf, Switzerland

Filed Nov. 16, 1981, Ser. No. 322,063

Claims priority, application Switzerland, Dec. 23, 1980, 9495/80

Int. Cl.³ B22D *17/06*

U.S. Cl. 164—119 **7 Claims**

1. A low-pressure casting method for the casting of cast pieces within a displaceably arranged mold containing mold halves and a casting opening, comprising the steps of:

providing a substantially pressure-tight closed vessel containing a cover plate at its upper side equipped with a casting hole;

providing within said vessel which contains a molten metal a gas chamber above the molten metal;

displacing said mold in a substantially vertical plane prior to casting;

said step of displacing said mold including lowering said mold together with its casting opening onto said casting hole of said metal-containing vessel;

placing said lowered mold with its casting opening into form-locking alignment with said casting hole of said vessel;

pressing said mold onto the cover plate of said vessel;

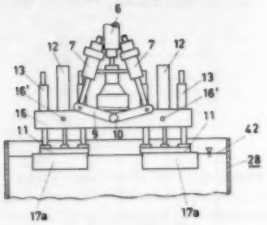
applying a gas pressure to said gas chamber to force the molten metal through the casting hole of the vessel and through the casting opening of the mold into the mold;

solidifying the cast piece formed in the mold;

venting the gas chamber following the solidification of the cast piece in the mold;

then further displacing said mold in said substantially vertical plane;

lifting the mold in a substantially vertical direction off of the vessel following venting of the gas chamber;



transporting the lifted mold in a substantially horizontal linear direction to a stripping station;

opening said mold at the stripping station;

removing the cast piece from the mold;

further displacing the mold following removal of the cast piece in a substantially linear direction to a washing, drying and finishing station;

rotating the mold halves of the mold within said vertical plane through an angle of approximately 90° in order to open the mold; and

lowering the mold halves at the location of a parting plane thereof such that frontal surfaces of the opened mold halves are lowered and immersed into a cooling and finishing emulsion bath at the washing station.

4,425,959

MOLD FOR CASTING INTERCELL CONNECTORS

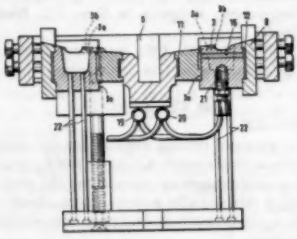
Ingo Mund, Brilon, Fed. Rep. of Germany, assignor to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG, Brilon, Fed. Rep. of Germany

Filed Jun. 15, 1981, Ser. No. 281,256

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023981

Int. Cl.³ B22D *19/00, 21/00, 25/04*

U.S. Cl. 164—342 **15 Claims**



1. In a mold for casting-on bridges which connect connecting lugs of sets of plates assembled into packs for lead storage batteries, the bridges having cell connecting flanges and end poles, respectively, formed thereon, the mold comprising a plurality of individual mold segments each having a substantially vertical contact surface and being vertically separable from each other, and each of the mold segments having, at a top surface thereof, a mold trough defined therein, said mold segments being assembled in a segment support to form a complete mold, the segment support comprising an elongate portion having a central feed trough defined therein and laterally extending arm portions at opposed ends of said elongate portion, said vertical contact surface of each of said mold segments facing said elongate portion of said segment support, each said mold segments at the top surface further forming at least a portion of a feed trough communicating with the central feed trough and said mold trough, the top surface being shaped to define an overflow weir between said portion of the feed trough and said mold trough, each of the mold troughs adapted to receive liquid lead overflowing from the central feed trough, flowing along the feed trough and then flowing over the overflow weir and into the mold trough, and cooling channels defined in said mold segments extending under said mold troughs, the improvement wherein

said individual mold segments having recesses defined therein constituting means for insulating said mold troughs of said individual mold segments from said cooling channels,

said recesses extending from said vertical contact surfaces of said mold segments to beyond said mold trough under substantially the entire top surface of each of said mold segments which defines said at least a portion of the feed trough, said overflow weir and said mold trough of each of said mold segments, said recesses being disposed above said cooling channels to insulate substantially the entire top surface of each of said mold segments from said cooling channels.

4,425,960

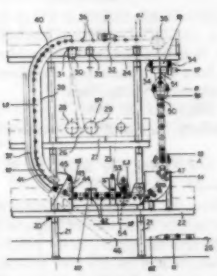
METHOD OF AND AN APPARATUS FOR THE MANIPULATION OF A STARTING CHAIN FOR FORMAT CHANGES IN A CONTINUOUS CASTING INSTALLATION

Hans J. Reuter, Kürten-Biesfeld; Hermann Take, Cologne, both of Fed. Rep. of Germany, and Charles Werner, Esch, Luxembourg, assignors to Mecan ARBED s.a r.l., Luxembourg, Luxembourg

Filed May 6, 1981, Ser. No. 260,931

Int. Cl.³ B22D *11/08*

U.S. Cl. 164—426 **5 Claims**



1. In a continuous casting apparatus including an installation for the manipulation of starting chain segments for continuous strand casting whereby such segments for starting the continuous strand casting process whereby such starting chain segments are coupled to and decoupled from a remainder of a starting chain, the improvement which comprises:

an arcuate first upright guide having an upper end and a lower end, said arcuate first upright guide being adapted to receive said remainder of starting chain;

means associated with said arcuate first upright guide for displacing said remainder into said arcuate first upright

guide and for retaining said remainder of starting chain at rest in said arcuate first upright guide;

an arcuate second guide having a lower end aligned with the lower end of said arcuate first upright guide and an upwardly opening upper end;

gripper means associated with said arcuate second guide and positionable above said upper end of said arcuate second guide for engaging a starting chain segment and lowering same into and retracting same from said arcuate second guide;

means associated with said gripper means for shifting said gripper means from a position wherein said gripper means is aligned with said upper end of said arcuate second guide into a position wherein starting chain segments can be transferred by said gripper means to or from a magazine; and

means between said guides for enabling the coupling and decoupling of links of said remainder of starting chain and a segment disposed in said arcuate second guide.

4,425,961

CONTINUOUS CASTING PLANT FOR THE HORIZONTAL CONTINUOUS CASTING OF STEEL

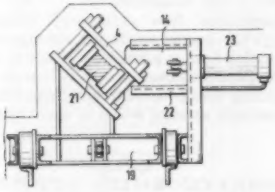
Kristof W. Tromel, Am Roten Kreuz 19, 4005 Meerbusch, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 332,340

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048483

Int. Cl.³ B22D *11/00*

U.S. Cl. 164—440 **7 Claims**



1. A continuous casting plant for the horizontal continuous casting of steel of the kind comprising a horizontally displaceable chill mould of generally rectangular form in cross-section and having an inlet which in use is adapted to be connected to a pouring spout of a pouring vessel, and shut-off means which are adapted to isolate the mould from the pouring spout when desired, wherein the mould is mounted on a displaceable truck and the shut-off means comprises a shear-plate which keeps the mould inlet closed when the mould is displaced to separate it from the pouring spout, the shear-plate also being mounted on said displaceable truck and being slidable relative to said truck in a direction perpendicular to the length of the mould and wherein said shear-plate is slidable in a direction generally parallel to a diagonal of the cross-section of said mould.

4,425,962

HEATING APPARATUS

William M. Cameron, Wellington, New Zealand, assignor to Macewans Machinery Limited, Wellington, New Zealand

Filed Feb. 17, 1982, Ser. No. 349,601

Int. Cl.³ B01F *15/06*

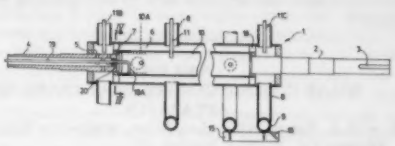
U.S. Cl. 165—92 **17 Claims**

1. A steam heated beatershaft comprising:

(a) steam inlet means connected with an outer steam chamber,

(b) outlet means to remove condensate and air connected with an inner co-axial collecting chamber,

(c) a plurality of spaced apart annular hollow rings mounted about and in steam connection with said steam chamber and,



(d) means for collecting condensate and air mounted in each ring and providing a flow connection between each ring and said collecting chamber.

4,425,963

HEAT INSULATION FOR DOME-SHAPED BOTTOM AND/OR COVER REGION OF A PRESSURE VESSEL

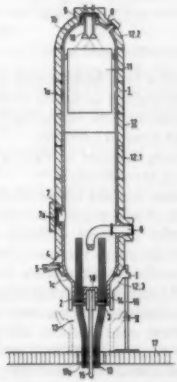
Manfred Scholz, Erlangen; Wolfgang-Peter Fricker, Freinsheim, and Bernd Gollasch, Nuremberg, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim and Grünzweig & Hartmann Montage GmbH, Ludwigshafen, both of, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 241,944

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1980, 3009134

Int. Cl.³ G21C *13/00*

U.S. Cl. 165—104.32 **6 Claims**



1. Heat insulation device for domeshaped bottom region of a pressure vessel, the heat insulation device being penetrated by a multiplicity of pressure vessel unions extending parallel to the axis of the pressure vessel heating rod flanges being secured to the respective pressure vessel unions and having respective heating rods extending therethrough and through the respective pressure vessel unions into the pressure vessel, comprising an integral dome disposed externally to the pressure vessel and formed of heat insulation having a passage formed therein for each of the pressure vessel unions, sheetmetal jackets defining the passages formed in the heat insulation dome, and respective sealing sleeves floatingly mounted with the outer circumference thereof disposed at the inner circumference of said sheetmetal jackets, respectively, said sealing sleeves effecting largely convection-proof sealing of said heat-insulation dome, in an operating position thereof, from the heating rod flanges, guide elements extending downwardly away from the pressure vessel and parallel to the axis of the pressure vessel for centering said heat-insulation dome with respect to the pressure vessel and for axially movably mounting said heat-insulation dome so that it can be lowered from said largely convection-proof operating position thereof to a storage position thereof

onto an assembly platform located below and spaced from the pressure vessel, whereby the union passages of the pressure vessel are exposed for in-service testing, and so that said heat-insulation dome can be raised back to said operating position thereof.

4,425,964

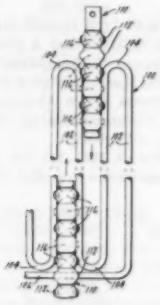
SOLAR COLLECTOR-TYPE HEAT TRANSFER APPARATUS

Kenneth L. Nelson, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Prospect Heights, Ill.

Continuation of Ser. No. 156,998, Jun. 6, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,447

Int. Cl.³ F28F *1/22*; F24J *3/02*

U.S. Cl. 165—171 **4 Claims**



1. A solar collector-type heat transfer apparatus comprising,

an elongated serpentine arranged conduit defining spaced parallel conduit sections sequentially connected by integral U-shaped conduit portions,

said conduit being adapted to have a heat transfer media communicated therethrough,

a plurality of heat transfer elements disposed one between adjacent pairs of said parallel conduit sections,

said heat transfer elements defining rows of open-sided recesses each having an internal concave surface,

said heating transfer elements being fixedly secured to said conduit and having longitudinal edge portions secured to said parallel conduit sections, each of said heat transfer elements having edge portions along the longitudinally opposite side edges thereof, with said edge portions being alternately deformed away from the plane of said elements so as to define pairs of longitudinal channels which at least partially receive the associated pair of parallel conduit sections.

4,425,965

SAFETY SYSTEM FOR SUBMERSIBLE PUMP

Russell I. Bayh, III, Carrollton, and William G. Boyle, Dallas, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 7, 1982, Ser. No. 386,035

Int. Cl.³ E21B *43/00, 34/06*; F16L *39/00*

U.S. Cl. 166—106 **12 Claims**

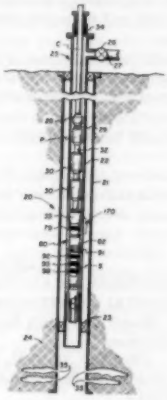
1. A safety system for a submersible pump, having an intake and a discharge, disposed within a well flow conductor comprising:

a. means for installing the pump within the flow conductor at a preselected downhole location and for forming a fluid seal with the interior of the flow conductor to direct fluid flow through the pump;

b. means for installing a subsurface safety valve within the flow conductor at the preselected downhole location below the submersible pump and for forming a fluid seal between the exterior of the safety valve and the interior of the flow conductor;

c. the safety valve having hydraulically actuated means for opening and closing the safety valve;

d. a landing nipple with a longitudinal bore therethrough comprising a portion of the flow conductor at the preselected downhole location;



e. the landing nipple comprising a portion of the means for installing the submersible pump and the safety valve within the flow conductor;

f. a longitudinal flow passageway extending partially through the landing nipple and communicating with the longitudinal bore at preselected locations; and

g. the longitudinal flow passageway comprising means for conducting fluid pressure from the pump discharge to the hydraulically actuated means to open the safety valve.

4,425,966

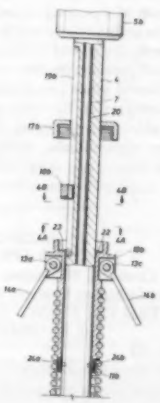
BOREHOLE CENTRALIZER WITH POSITIVELY INDEXABLE CONTACT ARMS

Tom A. Garney, Houston, Tex. assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 31, 1981, Ser. No. 289,002

Int. Cl.³ E21B *17/10*

U.S. Cl. 166—241 **7 Claims**



2. An apparatus for centralizing an instrument within a borehole, comprising:

an elongated shaft member, having a longitudinal slot therein, adapted for movement through a borehole;

at least one concentric carrier member rotationally and longitudinally movable with respect to said shaft member, said carrier member having a radially serrated inner surface;

arms means connected to said at least one carrier member for contacting the sidewall of said borehole; and

means for selectively indexing and positively locking said arm means in a selected one of a plurality of fixed rotational positions relative to said shaft member, said means including an insertable indexing member having a radially serrated surface complimentary to that of said carrier member and an extension portion longitudinally slidable within at least a portion of said longitudinal slot in said shaft member.

4,425,967

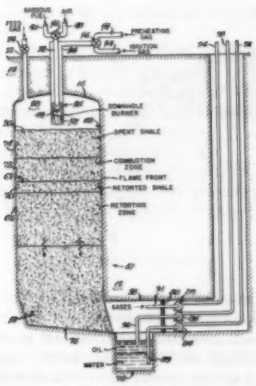
IGNITION PROCEDURE AND PROCESS FOR IN SITU RETORTING OF OIL SHALE

Gerald B. Hoekstra, deceased, late of South Holland, Ill. by Edith Hoekstra, executrix, assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 7, 1981, Ser. No. 309,274

Int. Cl.³ E21B *43/243, 36/02*

U.S. Cl. 166—259 **11 Claims**



1. A process for retorting oil shale, comprising the steps of:

positioning a downhole burner in a space between a roof and a rubblized mass of oil shale in an underground retort, said downhole burner having a central ejector having a central nozzle and an annular ejector positioned generally cocentrically about said central ejector;

ejecting a retorting gas comprising a substantially inert preheating gas selected from the group consisting essentially of nitrogen, steam, and retort off gases, from said annular ejector onto said rubblized mass for a sufficient time to preheat an upper portion of said rubblized mass to a temperature of at least 650° F. while substantially preventing said retorting gas from being ignited into a flame front by substantially preventing air and molecular oxygen from being discharged from said downhole burner while said retort gas is being ejected from said downhole burner onto said rubblized mass;

establishing a pilot light sustained by a mixture of gaseous fuel selected from the group consisting essentially of methane, retort off gases, and shale oil, and a sufficient amount of molecular oxygen to ignite said gaseous fuel in said central ejector, said retorting gas being heated by said pilot light;

terminating said retorting gas and said pilot light when said upper portion of said rubblized mass has been preheated by said retorting gas to a temperature of at least 650° F.;

establishing a flame front generally across said retort by ejecting a flame front-supporting gas containing from 5% to 90% by volume molecular oxygen from said annular ejector onto said heated portion of said rubblized mass of oil shale at a temperature from 900° F. to 1200° F., and

driving said flame front generally downwardly through said mass of oil shale with said flame front-supporting gas to liberate shale oil and light hydrocarbon gases from said oil shale.

4,425,968

SELECTIVE WATER EXCLUSION

Alfred Brown, Houston, and Wilbur L. Hall, Bellaire, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 24, 1982, Ser. No. 381,601

Int. Cl.³ E21B *43/22, 43/32*

U.S. Cl. 166—295 **11 Claims**

1. A method for selectively reducing the permeability of water-producing zones in a subterranean hydrocarbon formation penetrated by a well in fluid communication with at least one water-producing zone and at least one oil-producing zone, comprising the steps of:

(a) injecting a soluble oil into the formation.

(b) injecting water into the formation to drive the soluble oil away from the well and lower the residual oil saturation around the well;

(c) producing the well for a time sufficient to remove water which invaded any oil zones of the formation;

(d) displacing any fluids which have collected in the well;

(e) injecting a treating solution of isobutyl-methacrylate in acetone into the formation;

(f) injecting a non-condensable gas to drive the treating solution into the formation; and

(g) shutting-in the well for about 6 to 24 hours.

4,425,969

RAIL-MOUNTED BALLAST REGULATOR MACHINE

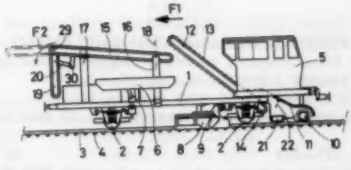
Rolando Naggar, Rome, Italy, assignor to Canron Inc., Crissier, Switzerland

Filed Jul. 23, 1981, Ser. No. 286,170

Claims priority, application Switzerland, Mar. 24, 1981, 2118/81

Int. Cl.³ E01B *27/00*

U.S. Cl. 171—16 **13 Claims**



1. A rail-mounted ballast regulator machine comprising:

a chassis having wheels running on the rails, ballast plow means mounted on the chassis in position to distribute and profile the ballast of the roadbed,

a rotary transverse brush mounted at the rear of the chassis rearwardly of said plow means in position to sweep ballast from the sleepers of the roadbed, and

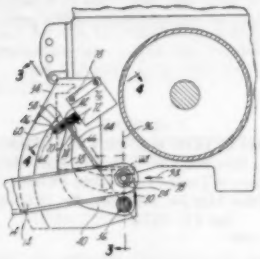
ballast transporting means for receiving ballast thrown up by said rotary brush and transporting it to a location in front of said ballast plow means.

4,425,970

TRACTOR DRAFT SENSING APPARATUS

Robert M. Dwyer, Livonia, and Edwin J. Skiba, Sterling Heights, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Sep. 21, 1981, Ser. No. 304,287
Int. Cl.[3] A01B 63/112
U.S. Cl. 172—7 10 Claims



1. A tractor draft sensing apparatus capable of sensing only draft forces, said tractor draft sensing apparatus comprising

a draft link for connecting an implement to a tractor and capable of transmitting the draft forces to be measured to the tractor;

sensing means interconnected with the tractor and capable of sensing movement of a member and generating a draft signal in response to said movement;

a mounting member having a first portion which is interconnected with the tractor for swinging movement relative to the tractor, said mounting member having a second portion to which the draft link is secured, the first and second portions of the mounting member being disposed in a plane extending at right angles to the draft forces to be measured;

a sensing spring formed integrally with the mounting member, said sensing spring being a leaf spring;

restraining means interconnected with the tractor and engaging another portion of the sensing spring at a location remote from the portion attached to the mounting member, said restraining means permitting nonbending movement of said another portion of the sensing spring; and

a sensing arm connected to the mounting member and having a portion disposed adjacent the restraining means, said portion of the sensing arm being engaged by the sensing means whereby variations of the draft forces to be measured transmitted by the draft link are detected by the sensing means.

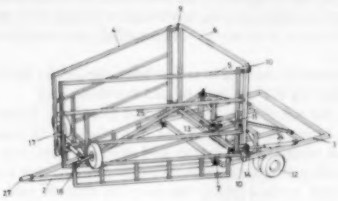
4,425,971

FOLDING AGRICULTURAL IMPLEMENT

Lyal D. Allen, Mannum, Australia, assignor to Horwood Bagshaw Limited, Edwardstown, Australia

Filed Nov. 12, 1981, Ser. No. 320,607
Claims priority, application Australia, Nov. 18, 1980, PE6529
Int. Cl.[3] A01B 73/00
U.S. Cl. 172—311 10 Claims

9. A folding implement of the type having a draft frame, a central implement frame and two side implement frames, one each located to each side of the central implement frame, said implement frames being adapted to have ground working tools mounted thereto, the folding implement being characterised according to this invention by a lift frame pivotally connected to the central implement frame so as to be rotatable about a generally transverse and horizontal axis, said lift frame being free of ground working tools, each side implement frame being pivotally connected one to each side of the lift frame, the implement being constructed so that in an operating position the lift frame will overlie at least part of the central implement frame and in a transport position the lift frame is rotated to be in a substantially vertical position and the side implement



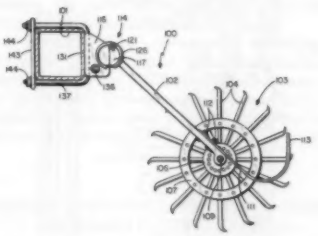
frames are in a folded location rotated about a now substantially vertical axis to reduce the width of the implement for transport.

4,425,972

SPLIT RING SPRING FOR EARTH WORKING TOOL

Richard W. Steinberg, North Mankato, Minn., assignor to Hiniker Company, Mankato, Minn.

Filed Aug. 10, 1981, Ser. No. 291,393
Int. Cl.[3] A01B 61/04
U.S. Cl. 172—551 47 Claims



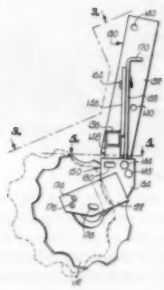
1. A mount assembly for an earthworking tool attachable to a support comprising: first means having a first convex curved outer surface and an outward directed first projection; means adapted to connect the first means to the support; second means having a second convex curved outer surface generally opposite the convex curved outer surface of the first means and an outward directed second projection, said first and second convex curved outer surfaces being oriented in a generally circular arrangement with the first and second projections being located adjacent each other; pivot means pivotally connected the first means to the second means for movement about an axis from a first position to a second position, said first and second means having portions engageable with each other when the second means is in the first position, said portions being separated from each other when the second means is in the second position, means adapted to connect an earthworking tool to the second means whereby the tool is located in an earthworking position when the second means is in the first position and in a trip position when the second means is in the second position, said tool moving about said axis between the earthworking position and the trip position; and C-shaped split spring means mounted on the first means and second means, said spring means having a first end engageable with the first projection, a second end engageable with the second projection, and an inside arcuate surface engageable with the outer convex curved surfaces of the first and second means whereby the spring means is mounted on the first and second means and biases the second means to the first position and thereby biases the earthworking tool to its earthworking position.

4,425,973

TRASH CLEARING DISC ASSEMBLY FOR PLANTERS

Donald E. Williams, and Forrest E. Robertson, both of Garden City, Kans., assignors to Acra-Plant, Inc., Garden City, Kans.

Filed Nov. 24, 1981, Ser. No. 324,434
Int. Cl.³ A01C 5/06
U.S. Cl. 172—574 7 Claims



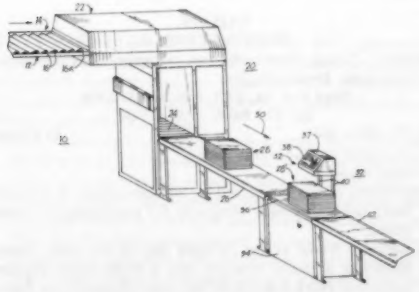
1. A debris-clearing unit for farm implements comprising:
a suspension member adapted for connection with an implement and provided with a crosshead;
a standard secured to the crosshead and extending upwardly therefrom;
a guide secured to the crosshead and depending therefrom;
a channel element in looped relationship to the guide;
a strap attached to the standard and to said element and extending upwardly from the latter;
a pair of brackets rigid to said element;
a disc for each bracket respectively; and
a mount for each disc respectively rotatably securing the same to its corresponding bracket with the discs converging forwardly toward the center of their normal path of travel.

4,425,974

METHOD FOR COUNTING SIGNATURES EMPLOYING A WEIGHING TECHNIQUE

Louis D. Kipp, Miramar, Fla., assignor to EDS-IDAB, Inc., Hialeah Gardens, Fla.

Filed Apr. 21, 1982, Ser. No. 370,346
Int. Cl.³ G01G 19/42
U.S. Cl. 177—1 23 Claims



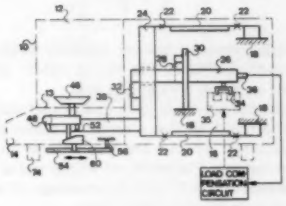
1. A method for confirming the count of a bundle of signatures comprising the steps of:
weighing the bundle to obtain the bundle weight;
comparing the measured weight against a predetermined standard to obtain a difference therebetween;
comparing said difference with a predetermined unit weight; and
confirming the accuracy of the original count if said difference is smaller than said predetermined unit weight.

4,425,975

WEIGHING APPARATUS INCLUDING CALIBRATING WEIGHT OPERATING MEANS

Paul Lüchinger, Uster, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Feb. 12, 1982, Ser. No. 348,344
Claims priority, application Switzerland, Apr. 10, 1981, 2418/81
Int. Cl.³ G01G 23/01
U.S. Cl. 177—50 6 Claims



1. In a weighing apparatus including a stationary housing (10); load receiving means including a vertical load receiving member (24), a scale pan (46), and horizontal carrier arm means (38) connecting said scale pan in laterally spaced relation to said load receiving member; and parallel guidance means (20, 22) connecting said load receiving member for vertical movement relative to said housing; the improvement which comprises
calibrating means for calibrating the operation of said weighing apparatus, said calibrating means including a calibration weight (48) removably mounted on said carrier arm means adjacent and generally below said scale pan, said calibration weight being generally U-shaped and arranged in a horizontal plane, the leg portions (48a) of said calibration weight extending generally parallel with and on opposite sides of the longitudinal axis of said carrier arm, the center of gravity of said calibration weight being generally coincident with the vertical axis of said scale pan.

4,425,976

SMALL-TYPE FOUR-WHEEL AUTOMOBILE

Sukeaki Kimura, Hamamatsu, Japan, assignor to Suzuki Motor Company Limited, Japan

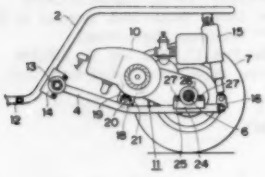
Filed Jul. 2, 1981, Ser. No. 279,700
Claims priority, application Japan, Nov. 28, 1980, 55-166607; Jan. 10, 1981, 56-1635; Jan. 10, 1981, 56-1636; Jan. 28, 1981, 56-10203
Int. Cl.³ B60K 5/04
U.S. Cl. 180—56 9 Claims

1. A small four wheeled automobile comprising:
a chassis frame having a forward end and a rear end;
a pair of front wheels rotatably mounted to said chassis frame near its front end;
a U-shaped swing arm having a pair of branched arms with forward ends pivotally mounted to said chassis frame at an intermediate location thereon, said U-shaped swing arm including a rear cross portion;
support means connected between said chassis frame adjacent its rear end and said swing arm;

a cross rod connected between said pair of branched arms rearward of said forward ends thereof;

an engine unit having a pair of shells defining a space and containing an interconnected engine, transmission with drive shaft, axle bearings and axle, said drive shaft rotatably mounted between said pair of shells;

first cushion mounting means resiliently mounting a lower forward portion of said engine unit to said cross rod;



second cushion mounting means resiliently mounting a rearward lower portion of said engine unit to each of said branched arms and around said axle;

a rear wheel connected to each end of said axle, said axle being of a length so that a center to center distance between each rear wheel is less than a center to center distance between each of said front wheels and at most equal to a distance between pivotal mountings of said pair of branched arms to said chassis frame.

4,425,977

AIR CLEANER SYSTEM FOR MOTORCYCLE ENGINE

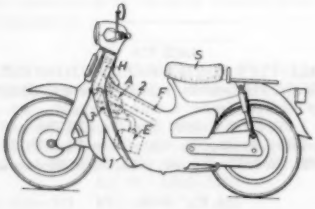
Masayuki Michiuchi, Kamifukuoka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1981, Ser. No. 334,563

Claims priority, application Japan, Jan. 17, 1981, 56-5078[U]; Jan. 17, 1981, 56-5079[U]; Jan. 17, 1981, 56-5080[U]

Int. Cl.³ B62J *17/06*

U.S. Cl. 180—225 **6 Claims**



1. In a motorcycle having a body frame with a seat, said frame supporting an engine, the improvement comprising, in combination: a leg shield on said body frame adapted to cover the front of the lower portions of the legs of a rider sitting on said seat, the body frame having a main pipe extending longitudinally between said leg shield and said seat, an air cleaner for said engine and having a suction port located on the internal side of said leg shield facing said seat, in order to exclude from said suction port ram air produced by forward motion of the motorcycle.

4,425,978

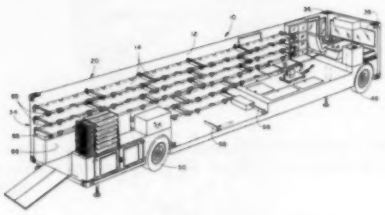
MOBILE HOSPITAL UNIT

Leon D. Star, Building #198, Kennedy International Airport, Jamaica, N.Y. 11430

Filed Sep. 14, 1981, Ser. No. 302,171

Int. Cl.³ B62D *47/00*

U.S. Cl. 180—243 **4 Claims**



1. An emergency hospital unit adapted for transportation to, and use at, a site of a major disaster preparatory to providing emergency medical treatment to injured survivors thereat, said unit being comprised of a standard cargo container of the type capable of airlift transportation to a selected location in the immediate vicinity of said disaster site and bounding an internal area of approximately eight feet in width, eight feet in height and forty feet in length for storage of medical equipment and facilities, and a four-wheel drive operatively embodied in the aforesaid container adapted to provide surface transportability thereto for movement of said container from said selected location to said injured survivors, said four-wheel drive consisting of an internal combustion engine-operated pair of wheels located adjacent the front of said container, and in locations adjacent the rear of said container and on each of the opposite sides thereof a cooperating operative arrangement of a wheel and of a hydraulic motor, said hydraulic motor being selectively operable to urge said rear wheels from a retracted position through descending movement to maintain a horizontal orientation in said container during which only said front wheels are powered in rotation by said internal combustion engine to cause movement in said container, and in said retracted position of said wheels, said hydraulic motor being operable to power in rotation said rear wheels such that in conjunction with said internal engine-operated front wheels said rear wheels also contribute to producing movement in said container, whereby said container has a four-wheel drive for facilitated movement at said disaster site and a front drive wheel drive and a horizontal orientation during the loading and unloading thereof in relation to an inclined loading ramp incident to the airlift transportation thereof.

4,425,979

MOTOR VEHICLE

William C. Young, Evansville, Ind., assignor to Young Motor Corporation, Evansville, Ind.

Filed Dec. 18, 1981, Ser. No. 332,086

Int. Cl.³ B60K *5/04, 17/04*

U.S. Cl. 180—264 **11 Claims**

1. A motor vehicle comprising

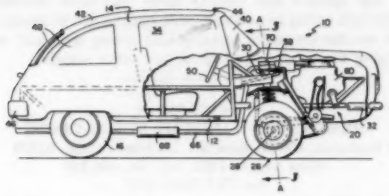
a main frame,

rear-wheel means connected to the main frame in substantially fixed alignment therewith for supporting the main frame,

a steerable frame at the forward end of the main frame, including a motor support, and a front-wheel support extending rearwardly from the motor support, the front-wheel support being pivotally supported with respect to the motor support about a horizontal axis,

front-wheel means connected to the front-wheel support rearward of and remote from the horizontal axis in fixed

alignment with the steerable frame, the front-wheel means having a laterally extending ground-engaging portion, and a pivot connecting the steerable frame to the main frame behind the front-wheel means, the lower end of the axis of



the pivot being in front of the upper end of the axis, whereby anular displacement of the steerable frame with respect to the main frame causes a lateral displacement of the ground-engaging portion of the front-wheel means in the direction of the anular displacement.

4,425,980

BEAM DAMPERS FOR DAMPING THE VIBRATIONS OF THE SKIN OF REINFORCED STRUCTURES

Ronald N. Miles, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 14, 1981, Ser. No. 330,082
Int. Cl.³ F16F *15/00*
U.S. Cl. 181—208 **30 Claims**

1. In a reinforced skin structure, wherein a skin is supported by spaced apart reinforcing elements, the improvement comprising: beam dampers attached to said skin between said reinforcing elements for damping vibrations of said skin, each of said beam dampers including:

a stiff, lightweight elongate beam formed so as to resist bending in at least one plane and including an attachment plate lying orthogonal to said at least one plane; and,

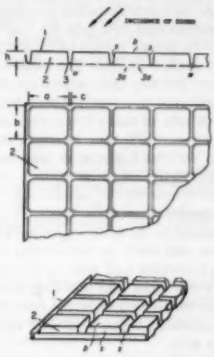
a layer of material that converts vibration energy into heat when deformed by vibration, said material located on one face of said attachment plate of said beam for attaching said plate to said skin such that said at least one plane in which said beam resists bending lies transverse to said skin, resulting in a thickness deformation of said layer of material when said skin vibrates, said thickness deformation of said layer of material converting vibration energy into heat to damp said skin vibration.

4,425,981

SOUND ABSORBING BUILDING COMPONENT OF SYNTHETIC RESIN SHEETING

Norbert Kiesewetter, and Bertalan Lakatos, both of Stuttgart, Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft Zur Förderung der Angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 85,378, Oct. 16, 1979, abandoned. This application Nov. 17, 1981, Ser. No. 322,275
Claims priority, application Fed. Rep. of Germany, May 23, 1979, 2921050
Int. Cl.³ E04B *1/82*
U.S. Cl. 181—286 **24 Claims**



1. A sound-absorbing building component for indoor paneling, comprising:

(a) a first sound-absorbing sheet, having a plurality of cup-shaped indentations lying side-by-side in a grid pattern, each of said cup-shaped indentations including (1) a planar bottom wall to be exposed to an acoustic field during installation, said bottom wall being excitable to a plurality of natural vibrations upon the incidence of sound at a plurality of frequencies and (2) a plurality of generally planar sidewalls which are also excitable to natural vibrations; and

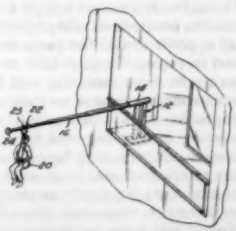
(b) a planar second sheet covering the upper rims of the cup-shaped indentations, wherein the air volumes contained in the individual cup-shaped indentations are at atmospheric pressure.

4,425,982

DEVICE AND METHOD FOR ESCAPING FIRE AND SMOKE IN HIGH-RISE BUILDINGS

William E. Kibbie, 1210 Mabury Ave., Santa Ana, Calif. 92701

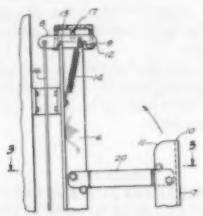
Filed Mar. 10, 1981, Ser. No. 242,322
Int. Cl.³ A62B *1/02*
U.S. Cl. 182—36 **1 Claim**



1. A life saving device for use in a high rise building to escape the smoke and heat of a fire, comprising:

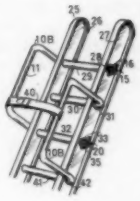
a telescoping pole comprising:
a first tube; and
a second tube having a diameter smaller than said first tube to permit said second tube to telecope in said first tube;
means for preventing said second tube from sliding out of said first tube when said telescoping pole is fully extended;
means, permanently, rigidly mounted near an opening in a habitable portion of said building, for cantilever supporting said telescoping pole, said pole and said support means having a use configuration in which said second tube is telescopingly extended relative to said first tube to place said pole in an outwardly oriented, horizontal position, which extends away from the side of said building, and having a storage configuration in which said second tube is nested within said first tube for compactness to permit said pole to be stored within said habitable portion of said building to protect it from the weather, while providing ready access thereto, said supporting means comprising a sleeve, connected to a support member, and sized to permit said first tube of said telescoping pole to telescopingly slide therein, said first tube having a stop member which cooperates with said sleeve in said use configuration to prevent said first tube from sliding completely through said sleeve;
a seat for supporting a user;
a trolley mechanism, detachably connected to said seat, and mounted on said pole, for supporting said user from said pole and permitting said user to travel outwardly along said pole, away from said building; and
means, connected to said pole, for restricting travel of said trolley mechanism when said user reaches the outward end of said pole.

4,425,983
FOLDING FIRE ESCAPE LADDER
Cheyenne A. Reinhard, 29372 Providence Way, Hayward, Calif. 94544
Filed Oct. 9, 1981, Ser. No. 310,108
Int. Cl.³ E06C *9/12*
U.S. Cl. 182—96 **3 Claims**



1. A folding fire escape ladder adapted to be secured to a wall comprising a first upright L-shaped in transverse cross-section to provide a first projecting flange and a first transverse flange parallel to said wall; a second upright L-shaped in transverse cross-section to provide a second projecting flange parallel to and facing opposite to said first projecting flange and to provide a second transverse flange parallel to said first transverse flange; means for interconnecting said first and second uprights for arcuate motion relative to each other between a spaced, parallel position and a nested, parallel position; a lever mechanism including a lever disposed between and spaced from said first and second projecting flanges and having a hook and notch at one end thereof, said lever mechanism including a cap having an edge, said cap tightly engaging said lever for motion together therewith; means including a fulcrum connection for mounting of said lever mechanism on the transverse flange of one of said uprights to permit pivoting of the lever mechanism without longitudinal disengagement thereof from the transverse flange of said one of said uprights; a spring connected to said lever mechanism and to said one of said uprights for urging said hook and notch toward the transverse flange of the other one of said uprights; and means forming a cam on the projecting flange of the other one of said uprights adapted, when said uprights are moved relative toward each other, to engage against and below said edge of said cap to cam said cap upward and thereby move said lever mechanism against said spring to pass said other upright and to release said lever mechanism under force of said spring with said notch engaging the transverse flange of said other upright.

4,425,984
REMOVABLE HANDRAIL FOR LADDERS
Paul Lachance, 100 Division St., Rockland, Mass. 02370
Filed Aug. 9, 1982, Ser. No. 406,266
Int. Cl.³ E06C *5/36*
U.S. Cl. 182—106 **12 Claims**

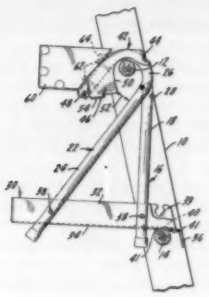


1. A single removable self-securing and side-reversible handrail for ladders comprising:
a ladder provided with at least one pair of horizontally aligned openings, and at least one separate opening spaced apart from the pair, all through the side rails of the ladder;
an elongated rigid straight handrail portion for manual grasping;
a rigid support portion permanently secured to and extending from each end of the handrail member to maintain the railing, in a fixed position spaced apart from the ladder;
a rigid elongated attaching portion permanently secured to each support away from the handrail portion, at least one of which attaching portions extends through both of the paired openings and the other of which attaching portions extends through at least one side rail opening; and
a movable permanently attached means of removably securing the attaching portion within the paired openings.

4,425,985
LADDER PLATFORM
Anthony Geisel, 109 S. Busse Rd., and Bohdan Rohowsky, 402 S. Main, both of Mt. Prospect, Ill. 60056
Filed Feb. 16, 1982, Ser. No. 349,047
Int. Cl.³ E06C *5/32, 7/14*
U.S. Cl. 182—121 **11 Claims**

1. A platform device which has utility as a ladder platform including a frame, said frame comprising support members, two on each side, with the support members on each side being joined adjacent their upper ends and spread apart at their lower ends, means joining the corresponding upper and lower ends of the support members of one side with the support members of the other side,
one of the support members on each side having a curved portion at the upper end thereof, said curved portion being formed and adapted to rest upon the rung of a ladder, with the means joining the lower ends of said support members being formed and adapted to rest upon a lower adjacent ladder rung,
and a hook member pivotally attached at opposite sides thereof to the distal ends of said curved portions, said

hook member being formed and adapted to be self-locking upon the upper rung and comprising a pair of spaced hook



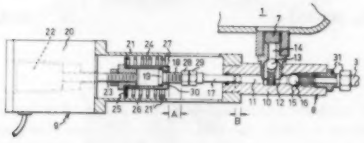
elements, each pivoted to the distal end of one of said curved portions, and a grab bar connecting said hook elements.

4,425,986

APPARATUS FOR LUBRICATION OF RAILS

Per Wedlin, Solna, Sweden, assignor to AB Erik Bohlin, Solna, Sweden

Filed Oct. 5, 1981, Ser. No. 308,676
Claims priority, application Sweden, Oct. 17, 1980, 8007317
Int. Cl.³ B61K *3/02*; G01F *11/06*
U.S. Cl. 184—3.2 **3 Claims**



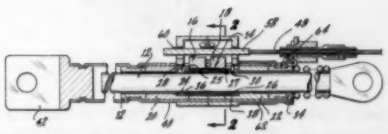
1. Apparatus for portional ejection of lubricant for lubricating railway rails, comprising a tank for storing lubricant, an outlet in said tank, a dosage pump for ejecting lubricant having an inlet and an outlet, a passage connecting said tank outlet to said pump inlet to conduct lubricant from the tank to the pump, a nozzle operatively connectable to said pump outlet for dispensing lubricant ejected by said pump, said dosage pump comprising an ejector section body, a cylindrical bore in said body defining a dosage, an ejector piston operatively slidably disposed in said bore to eject lubricant therefrom through said pump outlet when said piston is reciprocated, an operating section frame member attached to said body, an electromagnet mounted on said frame member, an armature slidably mounted in said electromagnet to be reciprocated when said electromagnet is energized, an armature rod connected at one end to said armature, a sleeve member fixedly connected at one end to the other end of said armature rod, a radially inwardly extending flange on the other end of said sleeve member, a hollow chamber in said sleeve member between said ends thereof, a hole through said flange, a connecting rod attached at one end to said piston and extending slidably through said hole at the other end, a flanged head on said other end of said connecting rod within said chamber to retain said sleeve member on said connecting rod, an abutment member on said one end of said connecting rod which is attached to said piston a predetermined distance from said flange on said sleeve member and adapted to be engaged by said flange to reciprocate said piston to eject lubricant after said armature has been displaced said predetermined distance by energizing said electromagnet, a return spring operatively mounted between said frame member and said sleeve member to return said armature, sleeve member and piston after each ejection of lubricant, control means to energize said electromagnet at predetermined intervals, a check valve in said pump inlet to allow flow of lubricant into said bore of the ejector section body during the return stroke of said piston and prevent flow of lubricant to said tank during the ejection stroke, and a check valve in said pump outlet to allow flow of lubricant to said nozzle during the ejection stroke and prevent backflow of lubricant from said nozzle during the return stroke.

4,425,987

DUAL ROTATING MECHANICAL LOCK

Clyde R. Porter, Los Angeles, Calif., assignor to P. L. Porter Company, Woodland Hills, Calif.

Filed Jun. 16, 1980, Ser. No. 160,133
Int. Cl.³ B65H *59/10*
U.S. Cl. 188—67 **1 Claim**



1. A mechanical lock for normally peventing axial motion of a rod with respect to a housing and for selectively permitting such motion when unlocked by an operator, said mechanical lock comprising in combination:

a coil spring having a first end and a second end;

a rod extending coaxially through said coil spring, the diameter of said rod being slightly larger than the inside diameter of said coil spring when it is not mounted on said rod, so that said coil spring normally grips said rod tightly when mounted on said rod;

a first rotatable bushing mounted coaxially on said rod adjacent the first end of said coil spring and including a surface inclined at an acute angle with respect to the axis of said coil spring and so located as to contact a portion of the last coil at the first end of said coil spring, whereby an axial load on said rod in a first direction wil cause said last coil to become cocked so as to grip said rod more tightly;

a second rotatable bushing mounted coaxially on said rod adjacent the second end of said coil spring and including a surface inclined at an acute angle with respect to the axis of said coil spring and so located as to contact a portion of the last coil at the second end of said coil spring, whereby an axial load on said rod in a second direction will cause said last coil to become cocked so as to grip said rod more tightly;

said first rotatable bushing and said second rotatable bushing engaging said first end and said second end respectively of said coil spring so that when said first rotatable bushing and said second rotatable bushing are rotated about said rod in opposite directions said coil spring will be slightly unwound at its first end and second end thereby releasing the last coil at the first end of said coil spring and the last coil at the second end of said coil spring from their locking engagement with said rod to permit axial translational motion of said rod with respect to said coil spring;

a first actuating lever connected to said first rotatable bushing and rotatable about the axis of said rod;

a second actuating lever connected to said second rotatable bushing and rotatable about the axis of said rod; said first actuating lever and said second actuating lever positioned at the same location along the axis of said rod and spaced circumferentially from each other;

a wedge-shaped cam mounted for motion in a direction parallel to the axis of said rod and positioned circumferentially between said first actuating lever and said second

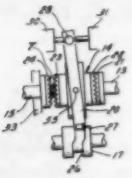
actuating lever to force said first actuating lever and said second actuating lever apart when said wedge-shaped cam is drawn in the direction parallel to the axis of said rod, whereby said first actuating lever and said second actuating lever are rotated about the axis of the rod simultaneously in opposite senses by equal amounts to unlock the first end and the second end of said coil spring.

4,425,988

INTERMITTENT ROTATIONAL DRIVE

David K. Stock, and Robert J. Wech, both of Green Bay, Wis., assignors to Amplas, Inc., Green Bay, Wis.

Filed Oct. 7, 1981, Ser. No. 309,266
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—18 R **19 Claims**



1. An intermittent drive transmission comprising a continuously rotatable cam that defines an operating cycle by each of its revolutions, an input member which rotates in synchronism with said cam through substantially the whole of said cycle and on which there is a concentric driving clutch element, a rotatable output member concentric with said input member and shiftable axially in opposite directions between a driving position in which a concentric driven clutch element at one axial end of the output member is engaged with said driving clutch element and a stopping position in which said clutch elements are spaced apart, and an elongated lever having at lengthwise spaced portions thereof a fulcrum, a connection with said output member, and a cam follower portion which is constrained by said cam, during an operating cycle, to move substantially in said directions to and from each of a pair of defined limits, said transmission being characterized by:

A. a rotatable braking element on the opposite axial end of said output member;

B. a relatively stationary braking element engaged by said rotatable braking element when the output member is in its stopping position to confine the output member against rotation;

C. means mounting said fulcrum for motion in said opposite directions; and

D. yielding biasing means acting in each of said opposite directions upon said fulcrum to urge it towards a predetermined medial position.

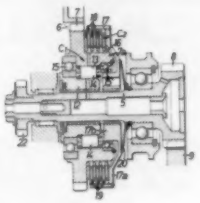
4,425,989

POWER TRANSMISSION SYSTEM FOR VEHICLES

Yusuke Gotoda, Tokyo, Japan, assignor to Honda, Giken, Kogyo, Kabushiki, Kaisha, Tokyo, Japan

Filed Mar. 26, 1981, Ser. No. 247,821
Claims priority, application Japan, Apr. 2, 1980, 55-42948
Int. Cl.³ F16D *47/04, 7/02*; B60K *5/04*
U.S. Cl. 192—48.92 **10 Claims**

1. A power transmission for a vehicle having an engine with a crankshaft and a driving wheel, said power transmission comprising a power transmission system, a clutch, a pair of reduction gears in mesh with each other and drivingly connecting said power transmission system and said clutch, a speed change gear device connecting said clutch to the driving wheel, said transmission system being interposed between the crankshaft of the engine and said clutch and comprising a driving member for connection to the engine crankshaft, a driven member for connection to the clutch through the pair of reduction gears, and means operatively connecting said driving and driven members together including a one-way clutch means and a friction clutch means, said one-way clutch means being operative to connect said driving and driven members



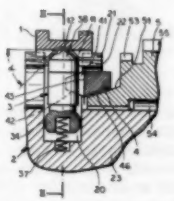
when a forward load is applied to the engine and being inoperative to disconnect said members when a back load is applied to the engine, said friction clutch means being operable to undergo slipping when it receives a torque greater than a predetermined level.

4,425,990

CLUTCH ASSEMBLY FOR GEAR TRANSMISSION

Walter Griesser, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 141,150, Apr. 17, 1980, Pat. No. 4,349,090. This application Oct. 16, 1981, Ser. No. 312,129
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2915965; Oct. 17, 1980, 3039231
Int. Cl.³ F16D *23/06*
U.S. Cl. 192—53 G **10 Claims**



1. In a gear transmission having a first gear, a second gear coaxial with said first gear, said gears being provided with respective sets of teeth of like pitch and diameter, and an internally toothed sleeve meshing only with the teeth of said first gear in a decoupling position, said sleeve being axially slidable into a coupling position in which it meshes with the teeth of said first and second gears for positively connecting same to each other,

the combination therewith of a synchro ring coaxially interposed between said gears with freedom of limited rotation relative to said first gear, said synchro ring carrying peripherally spaced-apart projections extending generally axially into cutouts of said first gear, said synchro ring and said second gear being provided with confronting clutch surfaces separated by an annular clearance from each other in the decoupling position of said sleeve, a spring-loaded detent member in each of said cutouts with a stem spacedly bracketed by curved camming areas of two of said projections and with a head extending substantially radially into an inner peripheral recess of said sleeve in said decoupling position, said head and said recess having camming formations for urging said detent member radi-

ally inward against the spring force acting thereon upon an axial shift of said sleeve, said synchro ring enabling disengagement of said head from said sleeve in a position of relative rotational alignment of said gears to permit completion of an incipient axial shift of said sleeve toward said second gear, said stem being in virtual point contact with the camming area of one of the bracketing projections in a position of rotational disalignment of said synchro ring relative to said first gear to resist disengagement of said head from said sleeve and thereby to prevent a complete shift of said sleeve into said coupling position, such disalignment resulting from a speed difference between said first and second gears upon the establishment of frictional contact between said clutch surfaces by an axial thrust exerted upon said synchro ring by said stem through the camming area of said one of the bracketing projections, the latter being repressible by said sleeve through the intermediary of said member for establishing said relative rotational alignment upon the substantial elimination of said speed difference.

4,425,991

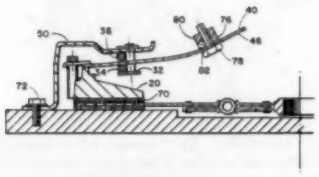
AUTOMOTIVE CLUTCH IMPROVEMENTS

Bill J. Hays, 10582 Palladium Ave., Garden Grove, Calif. 92640

Filed May 18, 1981, Ser. No. 264,585

Int. Cl.³ F16D *13/42*

U.S. Cl. 192—70.27 **14 Claims**



1. In a clutch cover assembly comprising a pressure ring for application of axial pressure to a clutch plate, a cover plate attached thereto forming a pressure plate chamber, a conical diaphragm spring mounted within said chamber and having a plurality of radial slots defining a plurality of radial fingers for engagement with a clutch release bearing, fulcrum means annularly spaced about said conical diaphragm spring to provide a fulcrum therefore whereby compression of said conical diaphragm spring releases pressure on said pressure plate, the improvement which comprises: a plurality of weight means, one each received in a respective radial slot of said diaphragm spring and mechanically interlocked to the immediately adjacent fingers of said diaphragm spring to develop a centrifugal force upon rotation and said plurality of weights being evenly spaced about and located above said diaphragm spring to transmit said force evenly across the surface of said diaphragm spring to urge the conical extension of said spring.

4,425,992

SYSTEMS FOR PREVENTING OVERHEAT OF ELECTROMAGNETIC CLUTCH FOR VEHICLES

Fujio Makita, Hachioji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 290,986

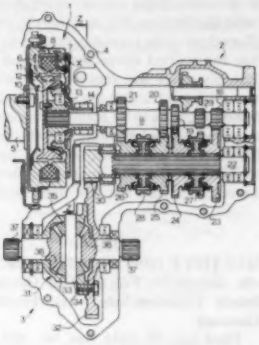
Claims priority, application Japan, Aug. 15, 1980, 55-112804

Int. Cl.³ F16D *27/02, 29/00*

U.S. Cl. 192—82 T **3 Claims**

1. A system for preventing overheat of an electromagnetic clutch for an internal combustion engine mounted on a vehicle, which has a drive member secured to a crankshaft of said internal combustion engine, a magnetizing coil provided in said drive member, a driven member adjacent to said drive member, and a transmission secured to said driven member, comprising

detecting means for detecting the temperature of said clutch for producing an electrical output signal relative to the temperature;



circuit means for controlling the clutch current passing through said coil so as to increase with the increase of the engine speed; and

a correcting circuit responsive to said output signal from said detecting means for rapidly increasing the clutch current.

4,425,993

FLUID ENGAGED SPRING RELEASED FAN CLUTCH HAVING A MODULAR MOUNT FOR A SPRING ENGAGED FLUID RELEASED FAN CLUTCH

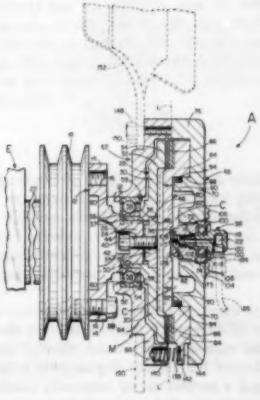
Hugh K. Schilling, St. Paul, Minn., assignor to Horton Industries, Inc., Minneapolis, Minn.

Filed Feb. 20, 1981, Ser. No. 236,622

The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.

Int. Cl.³ F16D *13/44, 25/063*

U.S. Cl. 192—85 A **13 Claims**



1. Modular mount connected to a clutch portion, with the clutch portion being one of a fluid engaged spring released clutch portion and a spring engaged fluid released clutch portion comprising, in combination: a rigid friction disc; a first outer shell section; means for rotatably mounting the first outer shell section with respect to the friction disc; with the clutch

portions comprising, in combination: a second outer shell section; a piston; means for reciprocably mounting and rotatably relating the piston to the second outer shell section, with the piston including an annular flange having an inner cylindrical surface; a friction ring mounted to the annular flange of the piston; means within the second outer shell section for causing the piston to slideably move and move the friction ring thereon to contact with the friction disc and thereby cause the first and second shell sections to be rotatably related to the friction disc; means within the second outer shell section for causing the piston to slideably move and remove the friction ring thereon out of contact with the friction disc and thereby cause the first and second shell sections to be rotatably independent from the friction disc; means for interconnecting the second outer shell section with the first outer shell section for supporting the second outer shell section and the clutch portion components mounted thereon solely by the first outer shell section.

4,425,994

MULTIPLE DISC FRICTION CLUTCH

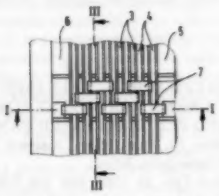
Franz Schele, Argenbühl, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

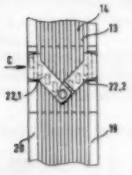
Filed Apr. 27, 1981, Ser. No. 257,787

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1980, 3016463

Int. Cl.³ F16D *25/063, 13/42*

U.S. Cl. 192—85 AA **6 Claims**





1. A multiple-disk friction clutch comprising:

an internally toothed outer clutch member;

an externally toothed inner clutch member rotatable relatively to said outer clutch member and surrounded thereby, one of said clutch members being connectible to a drive and the other of said members being connectible to a load;

a disk pack disposed between said members and including a first set of externally toothed friction disks rotationally entrained with said outer clutch member and engaging the teeth thereof but axially displaceable relative to one another and a second set of internally toothed disks interleaved with the disks of said first set and rotationally entrained with said inner member but axially shiftable thereon;

an annular piston on a first of said clutch members fluid pressurizable to compress said disk pack at one side thereof;

an end plate on said one of said members disposed along an opposite side of said pack whereby said piston upon energization of the clutch compresses said pack against said end plate;

a plurality of constraining elements distributed around the periphery of said disk pack and engaging the disks of at least one of said sets in pairs, at least upon deenergization of the clutch whereby said constraining elements form an extensible and contractible chain with the disks of said one of said sets to prevent flutter thereof; and

means for connecting said chain to said piston and said plate, said constraining elements being disposed between the disks of the respective pair and fixed on swivel-mounted supports inclined to the axis of the clutch.

4,425,995

COVER BELT CONVEYOR

Karl-Günther Blattermann, Hamburg-Rahlstedt; Günter Neuhaus, Hamburg, and Güther Nolte, Moers, all of Fed. Rep. of Germany, assignors to Conrad Scholtz AG, Hamburg, Fed. Rep. of Germany

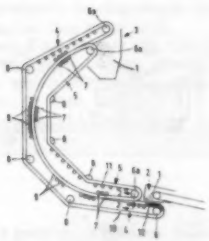
Continuation-in-part of Ser. No. 78,904, Sep. 25, 1979, Pat. No. 4,273,238. This application Jun. 12, 1981, Ser. No. 273,249

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 2841795; European Pat. Off., Sep. 26, 1979, 79103655.1

The portion of the term of this patent subsequent to Jun. 16, 1995, has been disclaimed.

Int. Cl.³ B65G *15/14*

U.S. Cl. 198—605 **7 Claims**



1. In a cover belt conveyor adaptable for use in conveying material from one level to another level and including a carrier belt and a cover belt entrained over respective return drums and having proximal runs defining a conveyor path therebetween, said belts defining proximal surfaces along said runs and extending in spaced apart substantially parallel relationship along the conveyor path, each belt also having opposite side edges thereon, and two longitudinally extending closure strips of flexible material, such as rubber or the like, projecting from the proximal surface of each belt adjacent the respective side edges thereof, the closure strips being so positioned that the closure strips of one belt fit between the cover closure strips of the other belt to form a closed box-shaped conveyor space between the proximal runs of the belts, the improvement comprising said closure strips of both belts having a periodic wave form defining wave ridges thereon which project substantially perpendicularly from said proximal surfaces of the respective belts with all of said closure strips projecting approximately the same extent from said proximal surfaces of the respective belts, each of said one belt closure strips being offset inwardly from the respective other belt closure strip adjacent the respective side edge of said other belt so that said one belt closure strips are spaced inwardly a relatively small extent from the respective other belt closure strips in the conveyor path, and profile knobs carried by each closure strip and projecting from the wave ridges thereof, certain of said profile knobs being located on the outer sides of said one belt closure strips, and certain others of said profile knobs being located on the inner sides of said other belt closure strips, said profile knobs being arranged in longitudinal rows extending substantially parallel with said belts and having contact surfaces thereon extending

substantially parallel to the longitudinal axis of the respective belt and facing toward the proximal surfaces of the one belt and the other belt, respectively, so that said contact surfaces of adjacent rows of profile knobs on adjacent one belt closure strips and cover belt closure strips will contact each other to aid in maintaining the closure strips of the one belt in the desired relation to said other belt closure strips along said conveyor path.

4,425,996

APPARATUS FOR TRANSPORTING WORKPIECES THROUGH A PROCESSING SYSTEM

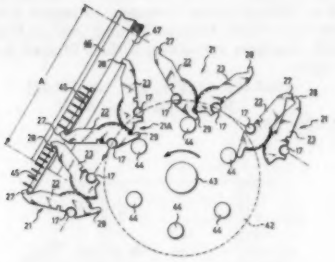
Johann Hoffmann, Freising, Fed. Rep. of Germany, assignor to Texas Instruments Deutschland GmbH, Freising, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,030

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1980, 3027896

Int. Cl.³ B65G *47/86*

U.S. Cl. 198—653 **16 Claims**



1. Apparatus for transporting workpieces in a transport direction through a processing system, said apparatus comprising two pairs of spaced rotatable sprockets; two parallel chains each engaging with a sprocket of each pair and extending in the transport direction through said processing system, a plurality of workpiece carriers disposed between said chains and extending parallel to each other transversely to the transport direction, each workpiece carrier including two fixedly interconnected support elements which extend parallel to each other between the chains, a plurality of workpiece clamps disposed on each workpiece carrier and each comprising two clamp members, one clamp member connected to one of said two support elements and the other clamp member connected to the other support element of said workpiece carrier, and means pivotally mounting at least one clamp member of each workpiece clamp about the support element with which it is connected for pivoting between a closure position and an open position, at least one pair of said two pairs of sprockets connected by transverse rods disposed parallel to the sprocket axis of rotation and on a circle about said axis of rotation for engagement with said at least one clamp member of the respective workpiece clamps during rotation of said at least one pair of sprockets to effect said pivoting between a closure position and an open position.

4,425,997

ARTICLE DISPLAY AND HOLDER APPARATUS

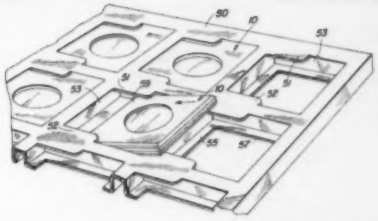
Robert F. Grant, 3234 S. Cuyler Ave., Berwyn, Ill. 60402

Filed Sep. 30, 1982, Ser. No. 430,526

Int. Cl.³ B65D *1/36, 85/58;* A45C *11/00*

U.S. Cl. 206—0.84 **6 Claims**

1. A display and storage device for an article comprising: enclosing means for receiving an article therewithin, and a receptacle including first and second separate plate members adapted to be removably assembled together with said enclosing means contained between said plate members, said plate members each having a central aperture defining viewing windows for an article, said first and second plate members being rectangular in shape and identical in size and configuration with each plate member having a generally planar inner surface with first and second ridges and first and second channels, the first and second ridges being located adjacent to first and second opposing edges, respectively, of the plate member and extending parallel to one another and to said first and second edges, and the first and second channels being located adjacent to third and fourth opposing edges, respectively, of



the plate member and extending parallel to one another and to said third and fourth edges, the first and second plates being assembled together with their inner surfaces opposing one another and with the first and second edges of the first plate member overlying the third and fourth edges of said second plate member whereby the ridges of the first plate member are received in frictional engagement with the channels of the second plate member and the ridges of the second plate member are received in frictional engagement with the channels of the first plate member to hold the plate members together.

4,425,998

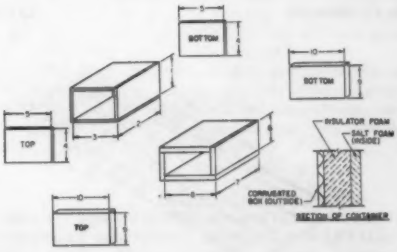
PROTECTIVE PACKAGING FOR THERMOLABILE GOODS USING COMPOUNDS WITH MELTING POINTS SLIGHTLY BELOW THERMOSENSITIVE TEMPERATURE OF THE GOODS

Craig R. Hof, Hopatcong, and Hasmukh Shah, Irvington, both of N.J., assignors to PyMaH Corporation, Sommerville, N.J.

Continuation of Ser. No. 112,753, Jan. 17, 1980, abandoned, which is a division of Ser. No. 15,080, Jan. 26, 1979, which is a continuation-in-part of Ser. No. 946,467, Sep. 28, 1978, abandoned. This application Feb. 28, 1983, Ser. No. 470,333

Int. Cl.³ B65D *81/18, 81/24, 85/20, 85/24*

U.S. Cl. 206—306 **46 Claims**



24. A container for protecting thermolabile goods having a thermosensitive temperature, from high temperatures, comprising:

a layer completely enclosing said goods comprising a non-permeable enclosing compound having a melting point slightly less than the thermosensitive temperature of said goods, and having a capacity to absorb heat, in an amount

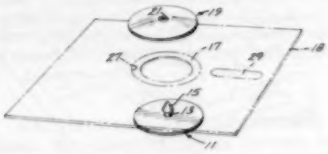
effective to protect sid goods when the temperature of the environment exceeds the melting point of the compound.

4,425,999

SECURITY SEAL APPARATUS

Christopher N. MacDonald, 2300 Fairview Ave., #D-203, Costa Mesa, Calif. 92626, and Vesta J. Crow, 2138 Adriatic Ave., Long Beach, Calif. 90810

Filed Sep. 24, 1982, Ser. No. 422,709
Int. Cl.³ B65D *85/57, 55/00, 27/20*
U.S. Cl. 206—444 **10 Claims**



1. A security seal apparatus for restricting access to an aperture formed centrally in a work piece carrying sensitive information thereon, said assembly comprising:

a rigid pad for covering said one side of said work piece and including a stem projecting from one side thereof for projecting through said aperture when said pad is positioned in covering position on said one side;

a fastener plate for overlying said pad, being of sufficient size to project beyond the peripheral edges of said aperture and being formed centrally with and opening; and,

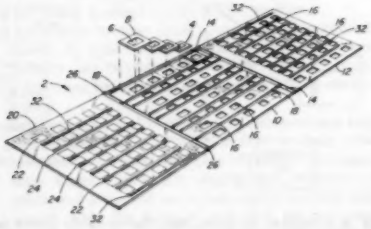
a lock formed on the free end of said stem, said lock being characterized in that it passes freely through said opening and is reponsive to projection beyond the periphery of said opening to non-releasably lock said pad and fastener plate together to seal said pad and plate in sealing engagement in said aperture whereby said stem must be severed to remove said pad from said one side thus leaving perceivable evidence that access has been had to said work piece.

4,426,000

SLIDE HOLDER FOR COMPOSITE PHOTOGRAPHS AND METHOD OF PHOTOGRAPHING SLIDES

Brian T. Dunn, 30 Oakwood Ave., Nepean, Ontario, Canada K2E 6A5

Filed Sep. 24, 1982, Ser. No. 422,965
Int. Cl.³ B65D *85/30*
U.S. Cl. 206—455 **12 Claims**



1. A holder to secure in position a plurality of slides, each slide having a film portion circumscribed at its top, bottom and sides by an opaque edge portion, to enable taking a composite photograph thereof with camera means, external thereto, the holder comprising:

(a) a planar base frame to receive on its surface certain of the slides to be photographed;

(b) a planar secondary frame to be positioned in operative position over the base frame and adjacent and parallel thereto, this secondary frame to receive on its surface other of the slides to be photographed; and

(c) transparent portions in the frames of sufficient area and positioned, with respect to the film portions of the slides when the slides are mounted on the frames, to underlie those film portions, these transparent portions of one frame being positioned with respect to the transparent portions of the other frame when in operative position so that the entire film portion of each slide may be exposed to the camera means; and

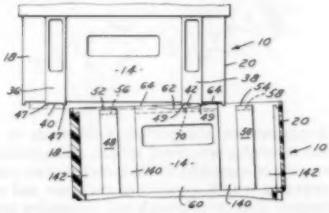
(d) means associated with frames to position the slides in a plurality of rows or columns over the transparent portions of the frames and to releasably hold the slides flushly on the surface of the corresponding frame in that position.

4,426,001

NESTABLE AND STACKABLE CONTAINER

Edward L. Stahl, Brighton Township, Livingston County, and Elsmer W. Kreeger, Allegan Township, Allegan County, both of Mich., assignors to Pinckney Molded Plastics, Inc., Pinckney, Mich.

Filed Sep. 14, 1981, Ser. No. 302,075
Int. Cl.³ B65D *21/04*
U.S. Cl. 206—507 **5 Claims**



1. A nesting and stacking container comprising a square bottom, side walls projecting upwardly from the opposite side edges of said bottom, end walls projecting upwardly from the opposite end edges of said bottom, each wall of said container having a plurality of feet spaced from one another along the lower edge portion thereof, each wall of said container having a plurality of saddles spaced from one another along the upper edge portion thereof, the saddles of each wall being located directly above the feet thereof so that the feet of said container will engage the saddles of a similarly oriented, lower container of identical construction and support the same in a stacked relationship, each wall of said container having a plurality of spaced clearances laterally offset from the saddles thereof, the width of the clearances of the side walls exceeding the width of the feet of the end walls and the width of the clearances of the end walls exceeding the width of the feet of the side walls, the spacing and lateral placement of the saddles of said end walls corresponding to the spacing and lateral placement of the clearances of said side walls, the spacing and lateral placement of the saddles of said side walls corresponding to the spacing and lateral placement of the clearances of said end walls, whereby when said container is turned 90° with respect to a lower container of identical construction it may be lowered into a nested relationship therewith without interference because the feet thereof will enter and pass through the clearances of the lower container, elongated, generally horizontal rails along each wall in general horizontal alignment with the saddles thereof, said saddles constituting horizontal extensions of said rails, and downwardly extending rail followers on certain of the feet on each said wall, said rail followers being adapted to engage the rails of a similarly oriented lower con-

tainer of identical construction to facilitate sliding thereof to a stacked position, said feet, rails and clearances on each wall being of such dimension and location that when said container is being slid to a stacked position on a similarly oriented lower container of identical construction said feet will be supported by said rails and bridge over said clearances.

4,426,002

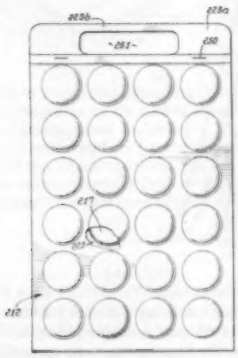
HANDLED MOLD PACKAGE

Donald H. Rez, 301 - 36th St., Newport Beach, Calif. 92663

Filed Aug. 13, 1982, Ser. No. 407,890

Int. Cl.³ B65D *83/04, 1/36;* **C10L** *11/02;* **B28B** *7/06*

U.S. Cl. 206—523 **6 Claims**



1. A shippable assembly comprising

(a) a first mold having a recess therein, and cast and hardened material in said recess, and

(b) a protective package on the mold, said package comprising a second mold having a recess therein, and cast and hardened material in said second mold recess,

(c) said molds surrounding said material in said recesses, and being interconnected and retained in mutually protective adjacency,

(d) the package including a protective sheet confined between the two molds and separating the material in said recesses, said sheet connected to at least one of the molds and projecting from the molds to support same including said material when the sheet is oriented vertically.

4,426,003

DRAIN CLEANER PACKAGE

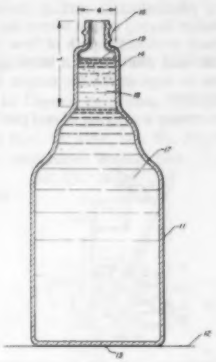
Jack Zarov, 9228 N. Kildare Ave., Skokie, Ill. 60076

Filed Feb. 8, 1982, Ser. No. 346,499

Int. Cl.³ B65D *85/84*

U.S. Cl. 206—524.4 **11 Claims**

1. A drain cleaner package comprising a fluid container adapted to rest on a horizontal surface and having a flat bottom and a sealable opening at the top, a body of caustic liquid within said container and a layer of immiscible liquid being of



lower density than said caustic liquid and substantially inert thereto.

4,426,004

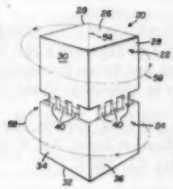
TAMPER PROOF CONTAINER AND METHOD

Steve W. Hoag, 545 French St., Adrian, Mich. 49221

Filed Nov. 18, 1982, Ser. No. 442,552

Int. Cl.³ B65D *49/12, 85/56*

U.S. Cl. 206—525 **10 Claims**



1. A tamper proof container for medicine bottles and the like, comprising:

a bottom portion having a bottom wall and a side wall permanently joined to said bottom wall extending generally perpendicular thereto and completely surrounding said bottom wall,

a top portion having a top wall and a side wall permanently joined to said top wall extending generally perpendicular thereto, completely surrounding said top wall and spaced from said bottom portion side wall, and

spaced frangible intermediate portions interconnecting said top and bottom portions side walls preventing opening of said enclosure without breaking said frangible intermediate portions and providing evidence of entry into said container.

4,426,005

DEVICE FOR PREVENTING SCATTERING OF PARTICLES FOR COLOR SORTING APPARATUS

Toshihiko Satake, Higashi-Hiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1981, Ser. No. 283,817

Claims priority, application Japan, Aug. 6, 1980, 55-108493; Oct. 9, 1980, 55-141243

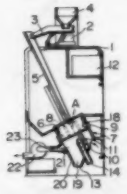
Int. Cl.³ B07C *5/342*

U.S. Cl. 209—581 **2 Claims**

1. In a color sorting apparatus having a particle chute in which particles to be sorted flow down, particle supplying

means for supplying said particles to the upper end of said chute, and a photoelectric sorting chamber disposed at the lower end of said chute, the photoelectric sorting chamber accommodating a photoelectric sorting device including a photoelectric detector having a light source and a light-receiving element disposed around the path of flow of said particles coming down from said chute, and a blowing nozzle device adapted to operate in response to the output from said sight-receiving element;

a device for preventing scattering of said particles characterized by comprising a scattering prevention wall disposed between said photoelectric detector and said blowing nozzle device and having a passage bore permitting the flowing particles to pass therethrough, said scattering prevention wall dividing the space in the photoelectric chamber into an upper space constituting a light detecting section and a lower space constituting a blowing sorting section, an air discharge window being formed in a wall defining the blowing sorting section, the space in the blowing sorting section being communicated with a suction blower through said air discharge window.

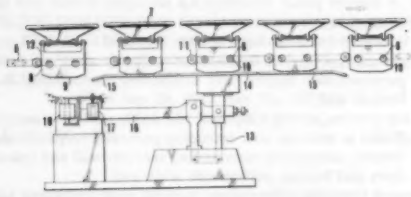


4,426,006

METHOD AND APPARATUS FOR SORTING FRUITS, VEGETABLES OR THE LIKE BY WEIGHT

Taichi Horii; Taro Horii, and Kazuo Haraguchi, all of Hamamatsu, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 335,668
Claims priority, application Japan, Jul. 9, 1980, 55-93491
Int. Cl.³ B07C *5/28*
U.S. Cl. 209—593 **8 Claims**



1. In an apparatus for sorting articles by weight, in which an article to be sorted is transported longitudinally in a basket along a chain conveyor to a weighing device for weighing the basket and article therein, the improvement wherein:

the conveyor includes a mounting member fixed thereto and longitudinally movable therewith for attachment to said basket;

said basket being loosely disengagably mountable on said mounting member so as to be vertically and longitudinally movable with respect thereto, said basket having a lower surface and a vertical abutting face;

a rotatable pushing member mounted for longitudinal movement with said chain conveyor, abutting said vertical face for pushing said basket longitudinally along said conveyor;

a weighing device disposed along said conveyor, for weighing said basket and the article therein, including a rail having means for slidably engaging said lower surface to raise said basket and concurrently disengaging said basket from said mounting member, without separating said pushing member from said vertical face,

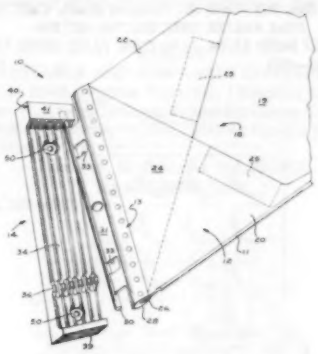
said basket being slidable onto said rail along said lower surface.

4,426,007

STORAGE FILE FOR MAGNETIC RECORDING DISKS

Vytautas K. Beleckis, East Longmeadow, and Raymond T. Cassidy, Ashfield, both of Mass., assignors to Dennison National Company, Holyoke, Mass.

Filed Aug. 25, 1981, Ser. No. 295,997
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—40 **5 Claims**



1. A filing unit comprising:

(a) A storage panel including a pocket formed by folding a unitary sheet of resilient synthetic plastic and being open along one edge for housing magnetic recording disks and the like, one face of the pocket being formed by overlapped flaps and a mounting rod disposed along an edge of said pocket;

(b) a panel holder having a plurality of spaced, parallel channels with a cavity at one end thereof opening toward said channels to receive one end portion of the mounting rod when the rod is fitted longitudinally into one of said channels, and

(c) said holder including retaining means comprising resilient detents which are spaced apart less than the diameter of said mounting rod for receiving the rod when it is moved angularly into one said channels, said rod pivotably interfitting within each of said channels so that the storage panels may be pivoted about the longitudinal axis of said rod.

4,426,008

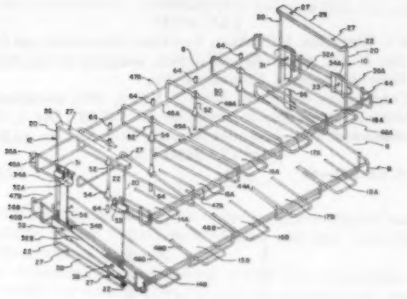
STORAGE SYSTEM FOR CANNED GOODS

Ralph B. Olson, Lombard, and Stuart I. Musick, Highland Park, both of Ill., assignors to Amco Corporation, Chicago, Ill.

Filed Dec. 1, 1980, Ser. No. 211,908
Int. Cl.³ A47F *1/00*
U.S. Cl. 211—49 D **8 Claims**

1. An article for storing and dispensing canned goods comprising two opposed upright supports; a plurality of adjacent downwardly inclined upper tracks mounted on the supports and adapted to receive a plurality of cans disposed on their sides, said tracks having apertures at their lower ends to enable the cans to drop through the tracks; a plurality of adjacent lower tracks mounted on the upright supports corresponding to and disposed below the upper tracks, said lower tracks being

inclined downwardly in a direction opposite to the incline of the upper tracks and adapted to receive the cans dropping through the apertures of the upper tracks; each upper and lower track formed by a pair of rails which supports the cans and lateral members disposed perpendicular to the plane of said rails between each pair of said rails; and means for aligning the cans in the tracks as they fall through the apertures of the upper tracks, said means being positioned adjacent said aper-



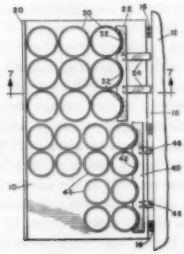
tures of the upper tracks and extending from the lateral members of the upper tracks to the lateral members of the lower tracks; said aligning means including a guide adjacent the bottom of the lateral members for the upper tracks and adjacent the top of the lateral members for the lower tracks for preventing the lateral members from interfering with the cans as they fall through the apertures of the upper tracks onto the lower tracks.

4,426,009

SYSTEM FOR POSITIONING CONTAINERIZED MERCHANDISE ON A SHELF

Thomas E. Pfeifer, 3129 Calle Abajo, Space 111, San Diego, Calif. 92139

Filed Jan. 26, 1981, Ser. No. 228,373
Int. Cl.³ A47F *5/00*
U.S. Cl. 211—86 **7 Claims**



1. A system for positioning cans on a shelf extending adjacent a wall, comprising:

an elongate spacing member having formed therein a plurality of arcuate recesses spaced longitudinally along a front surface of the member for each receiving a can so that its cylindrical axis extends transverse to the longitudinal dimension of the spacing member and a plurality of sockets longitudinally spaced along the spacing member and extending transverse to the longitudinal dimension of the spacing member; and

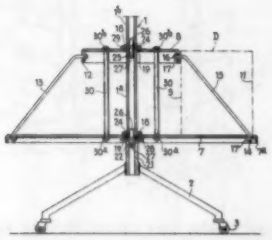
a plurality of support members each configured to provide a first end insertable in a corresponding one of the sockets and a second end engageable with a rear portion of a shelf upon which the spacing member may be placed to thereby hold the spacing member in position for receiving in its arcuate recesses a row of cans supported on their ends on the shelf.

4,426,010

FILING DRUM FOR A COLUMN HAVING ROTARY DRUMS

Gérard Le Mer, 12 Chemin du Milieu, 95540 Mery sur Oise, France

Filed Nov. 13, 1981, Ser. No. 321,267
Claims priority, application France, Nov. 17, 1980, 80 24331
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—163 **14 Claims**



1. In a filing drum for a column having rotary drums, the drum comprising two coaxial vertically spaced horizontal platforms having a generally circular shape, radially extending obliquely disposed separating rods connected to the two platforms and defining compartments in the shape of sectors for receiving files, or like objects, which are disposed vertically and have a vertical edge which is capable of abutting the periphery of the upper platform which is of smaller diameter than the lower platform, and means for rotatably mounting the drum on the column; the improvement wherein the two platforms are of sheet metal, the upper platform comprises a peripheral flange which is press-formed on the upper platform and said separating rods constitute struts which have end portions and fixing means fix said end portions respectively to the lower platform and to said peripheral flange, which flange performs the function of an abutment for the files or like objects.

4,426,011

MODULAR CANTILEVER RACK

Richard S. Jay, Niles, Ill., assignor to Jarke Corporation, Niles, Ill.

Filed Mar. 12, 1981, Ser. No. 243,086
Int. Cl.³ A47F *5/00*
U.S. Cl. 211—193 **8 Claims**

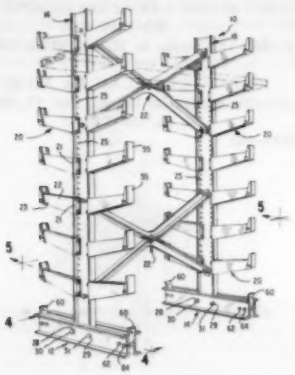
1. In a modular cantilever rack of the type having at least a pair of spaced apart base members, each base member having an apertured vertical support member upstanding therefrom, said vertical support members having brace members interposed therebetween, and said respective vertical accommodating at least one carrying arm mounted thereon and extending outwardly therefrom, the improvement comprising, in combination,

an improved base member assembly formed by a pair of spaced apart C-shaped channel members positioned in back-to-back relationship each having a pair of horizontally aligned carrying apertures positioned therein, each of said vertical support members being formed from an I-beam and having a lower support portion and an upper carrying portion,

said lower support portion of said I-beam support member being positioned between said pair of C-shaped channel members and having a pair of lamellar support bars

mounted adjacent the lower end thereof and positioned in vertically spaced horizontal planes one to the other,

said carrying apertures on said C-shaped channel base members being aligned between said vertically spaced apart lamellar support bars,



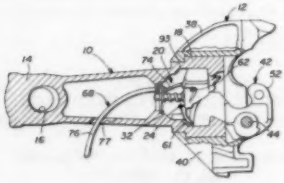
and a pair of tubular bars carried through said carrying apertures on said C-shaped channel base members and positioned between said pair of vertically spaced apart lamellar bars thereby to secure said vertical support member to said pair of C-shaped channel base members and prevent joint rotation therebetween.

4,426,012

RAILWAY CAR COUPLER

George E. Adams, III, East Aurora; Edwin C. Bailey, East Amherst; Richard F. Klimowicz, West Seneca, and Geoffrey W. Cope, Williamsville, all of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 23, 1981, Ser. No. 323,529
Int. Cl.³ B61G *3/06, 3/08*
U.S. Cl. 213—i35 **19 Claims**



1. A railway car coupler comprising:

a shank having a butt end portion at one end and a head end portion at the opposite end and including an elongated chamber extending axially from said head end portion toward said butt end portion;

a head connected to said head end portion of said shank;

a knuckle pivotally connected to said head and having closed and open positions;

a lock disposed within the shank chamber and axially movable therewithin between a knuckle engaged position for maintaining said knuckle in a closed position and a knuckle disengaged position for enabling said knuckle to be pivoted to said open position;

thrower means pivotally connected to said lock and having an arm disposed to one side of said pivot for engaging said knuckle to rotate the knuckle to its open position; and

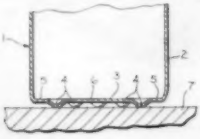
axially movable actuating means disposed within said chamber and connected to said thrower means at the opposite side of said pivot from said arm with movement of said actuating means within the chamber toward said butt end of said shank initially moving said lock axially toward said knuckle disengaged position, with continued movement of said actuating means in the same axial direction pivoting said thrower means and consequentially said knuckle to its open position after the lock has obtained its knuckle disengaged position.

4,426,013

CAN BODY

Ara A. Cherchian, Milwaukee; Karl Elert, Brookfield, and Gunther E. Ast, Milwaukee, all of Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Continuation of Ser. No. 875,634, Feb. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 748,057, Dec. 6, 1976, abandoned. This application May 25, 1979, Ser. No. 42,525
Int. Cl.³ B65D *7/42*
U.S. Cl. 220—66 **1 Claim**



1. A one-piece metallic can body for use in a can for a substance susceptable of generating substantial internal pressure, comprising

integral side and bottom walls, the side wall being cylindrical and the bottom wall in its completed unpressurized state being substantially flat, and being adapted to bow outwardly a substantial distance in response to internal pressure generated within the can after it has been completed and filled.

said bottom wall having portions projecting downwardly, away from the can interior, at a plurality of locations surrounding the central region of the bottom wall, the locations being spaced inwardly from the cylindrical side wall and disposed along a circle which is substantially coaxial with the central longitudinal axis of the can body,

wherein the annular peripheral region of the bottom wall disposed radially outward of said circle is disposed in a common plane with said central region when the can body is in a completed non-pressurized condition,

the projections serving as the support members for the can body, with predetermined points on said projections serving as the contact points to a support surface, when the bottom wall is in its normal substantially flat state, and

said projections also serving as the support members for the can body, with said predetermined points on said projections serving as the contact points, to provide a stable support surface for the can body, when the bottom wall is bowed outwardly a substantial distance beyond its normal state under the force of said internal pressure.

4,426,014

CLOSURE FOR OPEN MOUTH CONTAINER

Bertram W. Coltman, Jr., Winnetka, Ill., assignor to Republic Molding Corporation, Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 427,560
Int. Cl.³ B65D *39/00*
U.S. Cl. 220—307 **15 Claims**

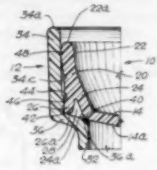
1. A closure formed of flexible molded plastic material and adapted to seal around the mouth at the open end of a storage container, comprising:

a main closure wall having an outer periphery and an inside

surface adapted to span across and close said container mouth when said closure is inserted into said open end of said container,

said main closure wall including a central portion deflectable inwardly toward an opposite end of said container, and

a peripheral flange integrally joined with said main closure wall around the periphery thereof and extended transversely away from said inside surface, said flange including a deflectable, depending skirt having a free end portion spaced outwardly of an outer peripheral edge of said inside surface of said main closure wall and separated therefrom by a groove,



said depending free end portion of said skirt establishing a continuous peripheral seal around the mouth of said open end of said container when said closure is inserted into said container and said inside surface is moved toward contact against said open end of said container by inward deflection of said central portion main closure wall.

4,426,015

CONTAINER

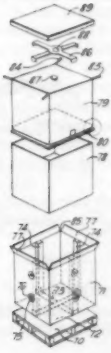
Frederick R. Preston, Wolverhampton; Ronald L. Grosvenor, Codsall near Wolverhampton, and Cecil Derry, Chase Terrace near Walsall, all of England, assignors to IMI Marston Limited, Wolverhampton, England

Filed May 14, 1981, Ser. No. 263,735

Claims priority, application United Kingdom, May 19, 1980, 8016408; Jan. 31, 1981, 8103019

Int. Cl.³ B65D *9/04, 6/26*

U.S. Cl. 220—403 **21 Claims**



1. An intermediate bulk container for liquids comprising a liquid-tight inner bag, an outer skin of polygonal shape and a top and base formed of flap extensions of the walls of the skin, a plurality of support struts, each located in an upright position away from the corner on the inside face of one side wall, each wall being provided with at least one rigid support strut, and the rigid support struts being secured to their respective side walls, in which there is provided upper tension means to interconnect the upper ends of the support struts so as substantially to prevent the upper ends moving apart and lower tension means to interconnect the lower ends of the support struts so as substantially to prevent the lower ends moving apart, the upper and lower tension means being located between the ends of the inner bag and the flap extensions of the walls and including integral tags to engage the support struts between the support struts and the wall of the container, the upper end flaps being of such a length that, when folded over to form a top to the container, they permit access to the liquid-tight inner bag.

4,426,016

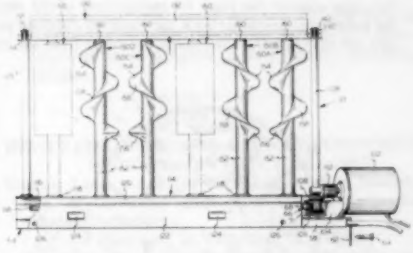
CONVERTIBLE DISPENSING MECHANISM FOR VENDING MACHINE

James Croteau, Hartford, and John A. Enders, Simsbury, both of Conn., assignors to Choice Vend Industries, Inc., Windsor Locks, Conn.

Filed Aug. 4, 1981, Ser. No. 290,091

Int. Cl.³ G07F *11/36*

U.S. Cl. 221—75 **10 Claims**



1. A convertible mechanism for dispensing generally cylindrical articles from a plurality of stacks contained in a vending machine, comprising: support means, including a base; at least three gear members mounted in meshing engagement with one another on said base for simultaneous rotation about parallel, generally rectilinearly aligned axes; at least three helical carriers vertically mounted on said support means and adapted to support the articles generally horizontally within their convolutions, each of said carriers being aligned on the axis of rotation of one of said gear members and having an upper helix portion and a lower helix portion, said upper helix portion being adapted to receive the articles and said lower helix portion being adapted to permit the release thereof at at least one rotational position of said carrier, each of said gear members having an axial, upwardly opening socket in which a lower end portion of the associated carrier is seated, said socket and end portion being cooperatively dimensioned and configured to permit removal of said associated carrier and to permit interengagement thereof for conjoint coaxial rotation in any of a plurality of angularly displaced relative positions; whereby the articles, withdrawn from the stacks and progressively lowered within the convolutions of said carriers during rotation thereof, can be discharged in a predetermined sequence depending upon the relationship between said lower helix portions of said carriers, and whereby said mechanism may be employed to dispense the article from three stacks disposed one behind another in the machine, and may be converted, by removal of at least one of said carriers and alteration of carrier position within said sockets to change the timing of discharge, for the dispensing of articles from only two of such stacks.

4,426,017

APPARATUS FOR DISPENSING CONTAINERS FROM A STACK OF NESTED CONTAINERS

Leonard A. Ficken, Manchester, and Gerald J. Podgorny, St. Louis County, both of Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Jun. 15, 1981, Ser. No. 273,506

Int. Cl.³ B65G *59/06*

U.S. Cl. 221—222 **5 Claims**

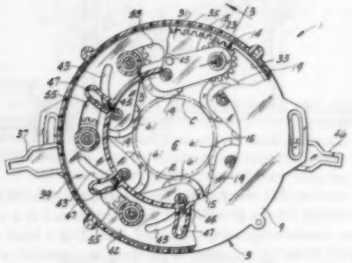
5. Apparatus for dispensing containers, such as paper cups, each having an outwardly extending rim, from a stack of nested containers, said apparatus being adapted to handle

containers of different diameters within a range of diameters, comprising:

a casing having a stack-accommodating opening therethrough adapted to be mounted with the axis of the opening generally vertical, said opening being dimensioned to accommodate containers up to the largest of said range;

a plurality of arms each pivoted at one end in the casing on a generally vertical axis, said arms being spaced at intervals around the opening and extending at their other ends into the opening, and being swingable in and out relative to the axis of the opening on their pivot axes for adjustment to handle containers of different diameters;

a plurality of cams, one for each arm, each cam being rotatable on a generally vertical axis on the respective arm at its said other end in the opening, each cam being rotatable in one direction on its arm from a first position wherein the cams support the stack by engagement of the rim of the lowermost container with the cams, to a second position for stripping the lowermost container from the next



container above and releasing the lowermost container to drop while retaining said next container supported on the cams by engagement of the rim of the next container with the cams and thus supporting the stack, the cams then being rotatable back to their stated first position;

means for rotating the cams in unison between their stated first and second positions comprising gearing associated with each arm including a pinion rotatable on the pivot axis of the arm and a ring gear rotatable in the casing surrounding the pinions and in mesh therewith; and

adjustment means for swinging the arms in and out to different positions of adjustment and holding them in adjusted position for handling containers of different diameters;

each arm having pivot means at said one end thereof pivoted in the casing, and said ring gear having a slot therein receiving said pivot means therethrough, said pivot means being engageable with the ends of the slot for limiting rotation of the ring gear thereby to confine rotation of the cams to rotation between said first and second positions.

4,426,018

METHOD AND APPARATUS FOR RECYCLING SCRAP

Dean L. Ward, Rte. 9, Box 262, Cumming, Forsyth County, Ga. 30130

Filed Jun. 17, 1981, Ser. No. 274,484

Int. Cl.[3] **G01F** *11/20*; **B67D** *5/60*; **B67B** *7/00*; **B65G** *17/36*

U.S. Cl. 222—1 **10 Claims**

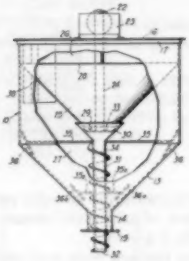
1. A metering assembly for feeding aggregate materials of different characteristics to a common area comprising:

(a) a housing having a lower discharge opening;

(b) a partition separating said housing into an upper hopper and a lower hopper, said lower hopper communicating with said discharge opening;

(c) an upright hollow, tubular, rotatable auger shaft communicating at its upper end with said upper hopper and passing downwardly through said lower hopper and through said discharge opening, said auger shaft having an open hollow interior throughout its length and an open lower end for discharging aggretate material by gravity from said upper hopper, through said open hollow interior and out of said open lower end;

(d) an auger flight carried by and protruding outwardly from the outer surface of said auger shaft for rotation therewith for contacting aggregate material in said lower hopper and for urging the aggregate material therein out



of said discharge opening when said auger shaft is rotated; and

(e) means for positively rotating said auger shaft for causing said auger flight to urge the aggregate material of said lower hopper out of said discharge opening without materially interfering with the flow by gravity of the aggregate material from said upper hopper through said hollow shaft.

4,426,019

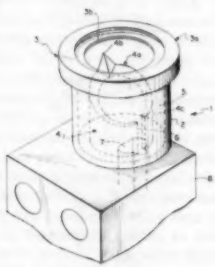
MEMBRANE SEAL AND KNIFE COMBINATION FOR A POST-MIX BEVERAGE DISPENSING SYSTEM

Jason K. Sedam, Dunwoody, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Oct. 15, 1981, Ser. No. 311,645

Int. Cl.[3] **B67B** *7/28*

U.S. Cl. 222—88 **19 Claims**



1. An opening device to be used in a post-mix beverage dispenser, together with a disposable syrup container, said container having a neck portion with an opening sealed by a rupturable membrane from which said syrup will flow when said membrane is ruptured, said device comprising a cylindrical piercing means surrounded by a cylindrically-shaped socket member, said socket member having a discharge port at the bottom thereof, said piercing means and socket member forming an annular compartment surrounding said discharge port defined by the outer wall of said cylindrical piercing means and the inner wall of said socket member for receipt of the neck of said container and drainage means through said outer wall of said piercing means for permitting syrup flow from said annular compartment to said discharge port, said

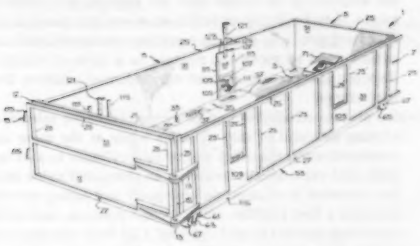
piercing means having an angular truncated cutting edge with a pyramidal piercing element on the apex thereof, said socket member being provided with a seal for securely receiving the neck of said syrup container into the compartment formed between said piercing means and socket member.

4,426,020

CONTAINER FOR TREATING AND TRANSPORTING INDUSTRIAL WASTE SLUDGES

Marcel Presseau, 4270 Ste-Rose Blvd., Fabreville, Quebec, Canada H7R 1X4, and Marc Villeneuve, 745 Charlevoix, Boisbriand, Quebec, Canada J7G 1W1

Filed Jul. 30, 1981, Ser. No. 288,416
Claims priority, application Canada, Dec. 30, 1980, 367748
Int. Cl.³ B65G *65/23*
U.S. Cl. 222—108 **6 Claims**



1. A transportable sludge container for draining a major part of the liquid settling out of the sludge directly on the premises of a sludge collecting site, said container comprising:

an enclosing wall including a front wall, a back wall, two side walls joining the front and back walls together, and a rectangular-shaped bottom wall, said bottom wall being shaped to slope downwardly toward each of said side walls from a central, longitudinally extending ridge and including draining areas between each of said side walls and said sloping bottom wall for passing the sludge liquid directed thereto by the sloping bottom wall;

means beneath the bottom wall for detachably mounting the container onto a truck platform;

means secured to the front wall for pulling the container onto the truck platform to transport it wherever desired, said means being also useful for retaining the container on the platform during its transportation and during dumping of the sludge, and for subsequently unloading said container from said platform at the same and at other sludge collecting sites; and,

means for opening and closing the back wall of the container to dump out the sludge contained therein whenever desired.

4,426,021

OPTICAL ILLUSION BEVERAGE DISPENSING DEVICE

L. Kenneth Rosenthal, 10306 Rossbury Pl., Los Angeles, Calif. 90064

Filed Nov. 5, 1981, Ser. No. 318,600
Int. Cl.³ B67D *1/00*; G09F *19/00*
U.S. Cl. 222—129.1 **10 Claims**

2. A beverage dispensing device for a restaurant which produces liquid droplets that fill a drinking glass while creating the illusion of said liquid droplets rising from said drinking glass, comprising;

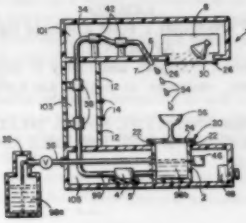
a reservoir which holds a liquid,

an oscillating pump which receives said liquid from said reservoir and applies pulsations to said liquid,

a nozzle which receives said liquid from said oscillating pump and converts said pulsations into said liquid droplets,

a flashing light source which illuminates said liquid droplets at, or above the flicker-fusion frequency, and

an enclosure, in which is mounted said reservoir, said oscillating pump, said nozzle, and said flashing light source, said enclosure means preventing ambient light from striking said liquid droplets directly thereby enhancing the illusion.

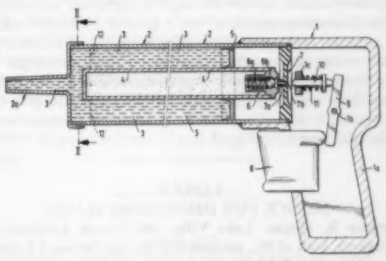


4,426,022

DEVICE FOR DISPENSING A SINGLE-COMPONENT OR MULTI-COMPONENT SUBSTANCE

Gusztav Lang, and Achim Hirsemann, both of Munich, Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Aug. 18, 1981, Ser. No. 293,943
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1980, 3031938
Int. Cl.³ B67D *5/60, 5/42*
U.S. Cl. 222—130 **8 Claims**



1. Device for dispensing measured amounts of a single-component or multi-component substance, such as an adhesive material, a sealing material or a filler material, comprising a container for the substance to be dispensed, said container is elongated having a first end from which the substance is dispensed and a second end, a piston located within said container and extending transversely of the first end-second end direction, said piston is displaceable in the first end-second end direction toward the first end for dispensing the substance out of said container, means for introducing a pressurized propellant into contact with the piston for displacing said piston toward the first end of said container, said means comprising a replaceable cartridge of a gasous propellant, said cartridge is located within said container and is separated from the part of said container holding the substance to be dispensed, said cartridge includes an outlet valve for discharging the gaseous propellant out of said cartridge, said container and said cartridge therein in combination with said piston forming a space between said piston and the second end of said container for receiving the gaseous propellant from said outlet valve so that the gaseous propellant acts on said piston for displacing said piston toward the first end of said container, a casing for holding the second end of said container, a flexible elastic member

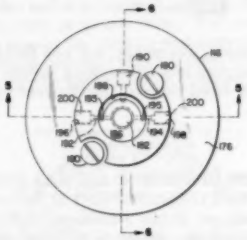
forming a closure across the second end of said container, means mounted within said casing for displacing said closure inwardly into said container for opening said outlet valve.

4,426,023

CLEANING ASSEMBLY FOR A FOAM DISPENSING APPARATUS

Charles R. Sperry, Westport, and Harry F. Riley, Southport, both of Conn., assignors to Sealed Air Corporation, Fair Lawn, N.J.

Filed Mar. 6, 1981, Ser. No. 241,013
Int. Cl.³ B67D *1/08, 5/60;* **B05B** *15/02*
U.S. Cl. 222—132 **10 Claims**



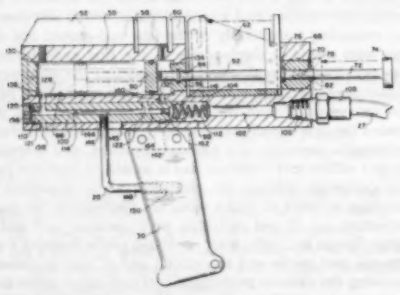
1. A cleaning assembly for use with a fluid dispensing apparatus comprising dispensing means positioned adjacent the face of a dispensing apparatus, said dispensing apparatus having a port in said face in communication with a chamber in said dispensing apparatus from which a first fluid is discharged, said dispensing means comprising a body having a surface forming an opening extending therethrough in alignment with said port of said dispensing apparatus and a groove formed in said surface adjacent said port to provide a reservoir within said opening for retaining a quantity of a second fluid discharged from said dispensing means, said dispensing means discharging said second fluid onto said face within said opening for preventing said first fluid discharged from said chamber from accumulating on said face at said port.

4,426,024

DEVICE FOR DISPENSING FLUID

Lawrence R. Hogan, Lake Villa, and Lenart Anderson, Mt. Prospect, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 11, 1981, Ser. No. 329,706
Int. Cl.³ A61M *5/00;* **B67D** *5/42*
U.S. Cl. 222—173 **5 Claims**



5. A device for operating a syringe, first to draw a precise amount of medicinal additive into the syringe and second to dispense the precise amount of medicinal additive from the syringe, said device comprising:

a body having an inlet port for communication with a source of pressurized fluid;

holder means on said body for receiving and holding a syringe;

actuator means on said body for engaging a plunger of the syringe;

powered means which includes a double-acting piston mounted in a cylinder formed in said body, said body having passage means communicating said inlet port with the ends of said cylinder of said powered means, and a piston rod connected between said piston and said actuator means, said powered means selectively moving said actuator means between a forward position where the syringe is ready to draw in a medicinal additive and a rearward position defining the precise amount of medicinal additive to be drawn into the syringe, said powered means thereby being operable to move the plunger in a rearward stroke to draw in a precise amount of medicinal additive and to move the plunger in a forward stroke to dispense the precise amount of medicinal additive from the syringe;

valve means included in said powered means for selectively venting one end of said cylinder while at the same time communicating the other end of said cylinder to said inlet port; said valve means including an elongated valve member mounted in a cavity in said body and being movable between a first position and a second position, said cavity extending parallel to said cylinder, said body having a first orifice between one end of said cylinder and said cavity and a second orifice between the other end of said cylinder and said cavity, said valve means having an axial passageway therein which is open at one end to said inlet port, a first radial port which extends from said axial passageway to the periphery of said valve member and which is normally in communication with said first orifice at said first position of said valve member, and a second radial port which extends from said axial passageway to the periphery of said valve member and which is adapted to mate with said second radial port in said second position of said valve member, spring means in said cavity adjacent said inlet port for urging said valve member to said first position, said body and said valve means having vent means for venting said first or second orifice when said second or first radial port is in communication with said second or first orifice; and,

trigger means connected to said valve means and operable upon depression thereof to move said valve member against said spring means to said second position thereof.

4,426,025

CONTINUOUS SPRAY OVERCAP

Michael G. Knickerbocker, Crystal Lake, Ill., assignor to Sequist Valve Co., Cary, Ill.

Continuation of Ser. No. 50,794, Jun. 21, 1979, abandoned. This application Aug. 27, 1981, Ser. No. 296,800
Int. Cl.³ B65D *82/14*
U.S. Cl. 222—182 **3 Claims**

1. A continuous spray overcap assembly for an aerosol can having a can rim located about the upper cylindrical edge of the aerosol can and a mounting cup rim extending about the periphery of the mounting cup with a valve stem extending upwardly from the center of the mounting cup, the improvement comprising:

a one-piece cylindrical overcap body having an integral sidewall and an integral overcap base extending across a first end of said cylindrical overcap body to form a one-piece cup-shaped overcap;

a first attachment means disposed on a second end of said cylindrical overcap body for resiliently engaging the aerosol can rim when said cup-shaped overcap is in a

protective position enclosing the valve stem extending from the mounting cup;

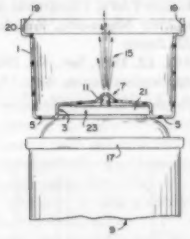
said overcap base extending inwardly from said integral sidewall and substantially perpendicular thereto forming an outer annular base portion defining an inner edge;

said overcap base including an inner cylindrical sidewall having a first and a second end and disposed parallel to said sidewall of said overcap body;

said first end of said inner cylindrical sidewall integrally attached to said inner edge of said outer annular portion with said second end of said inner cylindrical sidewall extending toward said second end of said overcap body;

said overcap base having an inner base portion disposed generally parallel to said outer annular portion and integrally extending from said second end of said inner cylindrical sidewall of defining a first substantially cylindrical recess within said overcap base coaxial with said cylindrical overcap body;

second attachment means comprising lug means integrally extending inwardly from said first end of said inner cylin-



drical sidewall for resiliently engaging the mounting cup rim when said cylindrical overcap body is inverted from the protective position;

said substantially cylindrical first recess having a cylindrical height being less than one quarter the cylindrical height of said cylindrical overcap body;

a second recess cavity located in said first recess cavity for receiving the valve stem therein to provide a seal with said valve stem when the overcap is inverted from the protective position;

said second recess being substantially cylindrical and extending from said first recess cavity in a direction toward said second end of said cylindrical overcap body;

an orifice disposed in said second recess cavity for fluid communication with the valve stem when the valve stem is inserted within the valve stem seal; and

said recess cavities being positioned relative to said overcap base enabling said second recess cavity to depress the valve stem to continuously spray aerosol product through said orifice when said second attachment means resiliently engages the mounting cup rim.

4,426,026

AEROSOL ASSEMBLY COMPRISING AN IMPROVED OVERCAP

Michael G. Knickerbocker, Crystal Lake, Ill., assignor to Seaquist Valve Co., Div. of Pittway Corp., Cary, Ill.

Filed Mar. 3, 1981, Ser. No. 240,021

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—402.13 **11 Claims**

1. An assembly for use with an aerosol container having an aerosol valve for discharging aerosol product and propellant through a terminal orifice, comprising in combination:

an actuator button in fluid communication with the terminal orifice;

said actuator button being connected to the aerosol valve through a valve stem for opening the aerosol valve upon movement of said actuator button;

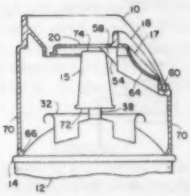
said actuator button having the substantial shape of a truncated cone having a larger cross-section at the base with respect to the cross-section at the top of said button;

a one-piece overcap having engaging means for securing to the aerosol container to at least partially cover said actuator button;

a finger actuator integrally mounted to said overcap;

said finger actuator being pivotably mounted to said overcap with the axis of said pivot being displaced from the axis of the aerosol valve;

engaging surface means disposed on the underside of said finger actuator for contacting said actuator button upon



movement due to finger pressure of the operator to open the valve and initiate product and propellant flow from the terminal orifice;

said engaging surface means comprising plural triangular-shaped rib projections for engagement with said truncated cone; and

said plural projections being spaced apart a distance less than the diameter of said top of said actuator button for centering said actuator button therebetween;

said triangular-shaped rib projections and said pivot of said finger actuator cooperating to provide a compound angle of movement between said engaging surface means and said actuator button for facilitating opening of the aerosol valve upon movement of said finger actuator by the operator.

4,426,027

POURING SPOUT FOR LIQUID CONTAINERS

Walter P. Maynard, Jr., Suite 236, 3070 Presidential Dr., Atlanta, Ga. 30340

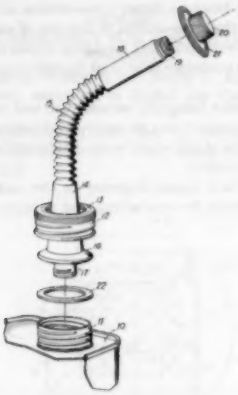
Filed Feb. 4, 1982, Ser. No. 345,786

Int. Cl.³ B65D *25/50*

U.S. Cl. 222—529 **1 Claim**

1. A pouring spout for a container having a threaded neck comprising a tubular elongated spout body which is at least in part flexible and provided at opposite ends with threaded necks of equal thread size, a threaded closure cap having a wide marginal flange approximately equal to the diameter of the container neck and adapted for threaded engagement with either of said equal thread size necks, an adapter portion integrally formed on one end of the spout body and having an enlarged ring substantially larger in diameter than the equal thread size necks and approximately equal in diameter to the container neck, a container neck sealing gasket adapted for engagement between the end of the container neck at either side of the enlarged ring, and a threaded adapter and sealing ring of sufficient size to pass over the enlarged ring and said gasket and adapter to threadedly engage the container neck and including an annular end wall adapted to bear on the enlarged ring when the spout is in a pouring position and to bear on said wide flange of the closure cap when the spout is in an inverted stored position within the container, said en-

larged ring of the adapter portion being roughly V-shaped in cross section and hollow, the adapter portion being conically



tapered away from one side of the ring and toward the outlet end of the spout.

4,426,028

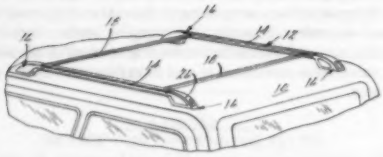
LUGGAGE CARRIER WITH ILLUMINATING MEANS

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Division of Ser. No. 33,897, Apr. 27, 1979, Pat. No. 4,269,339. This application May 21, 1981, Ser. No. 266,001

Int. Cl.³ B60R *9/04*

U.S. Cl. 224—325 **4 Claims**



1. A luggage carrier mounted on a substantially horizontal surface of an automotive vehicle, said carrier including spaced side members and spaced cross members, forming an interior area within said side members and cross members, stanchions located in at least two corners of the carrier securing the carrier to the vehicle, each said stanchion comprising spaced apart side exterior walls and at least one other exterior wall spanning said spaced apart side walls, at least one of said exterior walls facing away from said interior area of the carrier, and illuminating means, at least a part of said illuminating means being operably disposed on said one of said exterior walls of all of said at least two stanchions, whereby said illuminating means is adapted to direct light away from the interior of said carrier.

4,426,029

SAFETY BLADE FOR SEVERING STRETCHABLE FILM

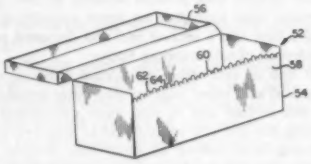
Ewald A. Kamp, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1981, Ser. No. 335,615

Int. Cl.³ B26D *1/02;* **B65D** *85/671*

U.S. Cl. 225—49 **17 Claims**

10. A dispenser box adapted for receiving a rolled-sheet of material, said box comprising a container compartment having side, end and bottom walls and a cover for the walls, a blade disposed on the dispenser box so that portions of the sheet material can be dispensed from the box and severed across the blade, the improvement comprising said blade having a plurality of spaced-apart piercing teeth and a plurality of spaced-



apart blunt projections which extend higher than the piercing teeth and are dispersed among said sharp piercing teeth so as to provide means for stretching and/or thinning a segment of the sheet material to be severed.

4,426,030

VARIABLE SPEED TAPE FEEDING APPARATUS

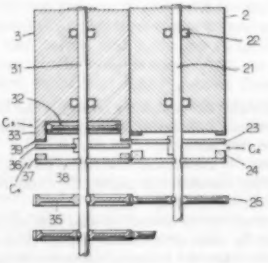
Kyoichi Yamashita, 2361 Nippa-cho, Kohoku-ku, Yokohama-shi, Kanagawa 223, Japan

Filed Aug. 12, 1981, Ser. No. 292,344

Claims priority, application Japan, Aug. 13, 1980, 55-110286

Int. Cl.³ B65H *23/18, 17/22*

U.S. Cl. 226—181 **8 Claims**



6. In a tape feeding apparatus comprising a pair of first and second cylindrical drums rotatable in tangential contact so as to pull a tape out of its roll by frictionally driving the tape therebetween, wherein said tape has a series of the same patterns and check marks printed thereon and is to be divided into sections which are intended to be of a certain predetermined design length, each bearing one printed pattern, the improvement comprising

the first drum mounted for free rotation on a first drive shaft and having a circumference slightly longer than the predetermined length of one section of the tape,

the second drum mounted for free rotation on a second drive shaft and having a circumference slightly shorter than said predetermined length of one section,

first means provided between said first drum and said first drive shaft for selectively interlocking the first drum with the first drive shaft,

second means provided between said second drum and said second drive shaft for selectively interlocking the second drum with the second drive shaft, and

means operatively connected to said first and second interlocking means for alternatively actuating the first and second interlocking means and associated with the continuously advancing tape for detecting whether the tape is fed for every one section with an increment or decrement,

wherein said detecting means functions to release the first interlocking means and actuate the second interlocking means when it detects that the tape is fed for one section

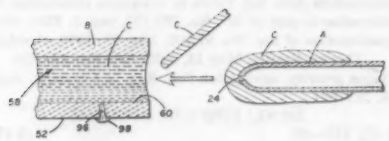
with an increment, but to actuate the first interlocking means and release the second interlocking means when it detects that the tape is fed for one section with a decrement.

4,426,031

METHOD OF SOLDERING INK JET NOZZLE TO PIEZOELECTRIC ELEMENT

Laszlo Halasz, Cleveland, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 91,210, Nov. 5, 1979, Pat. No. 4,308,546, which is a continuation of Ser. No. 886,882, Mar. 15, 1978, abandoned. This application Aug. 26, 1981, Ser. No. 296,093
Int. Cl.³ B23K *1/02*; G01N *15/00*; G01M *3/20*
U.S. Cl. 228—121 10 Claims



1. A method of assembling an ink jet tip assembly comprised of a piezoelectric element having a through passage with an ink nozzle received therein and dimensioned such that a gap is defined between the side wall of said passage and said nozzle, said method comprising the steps of:

(a) coating the side wall of said piezoelectric element passage with a first metallic alloy;

(b) coating at least a longitudinal portion of said nozzle with a second metallic alloy;

(c) heating said first and second alloys to at least their melting temperatures;

(d) inserting at least a portion of said nozzle to a desired oriented position within said nozzle in said passage; and

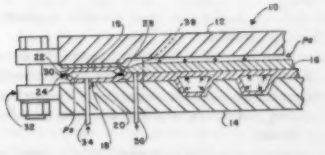
(e) allowing said first and second alloys to cool to their solid phase for fixedly joining said piezoelectric element and nozzle together.

4,426,032

TOOL SEALING ARRANGEMENT AND METHOD

Walter Leodolter, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 10, 1981, Ser. No. 300,767
Int. Cl.³ B23K *20/14*
U.S. Cl. 228—157 5 Claims



1. In superplastic forming and diffusion bonding apparatus which includes spaced, opposing tools, a tool sealing arrangement comprising:

a pair of metal blanks having effective strain rate sensitivity to be formed into a component by said apparatus, said blanks being located between said tools and having spaced apart inner and outer marginal peripheral edge portions connected together and expanded away from one another so as to form a seal between said blanks and tools about the peripheries thereof.

4,426,033

DUCTILE TITANIUM-COPPER BRAZING ALLOY

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 20, 1982, Ser. No. 420,072
Int. Cl.³ B23K *35/30*; C22C *9/00*
U.S. Cl. 228—56 14 Claims

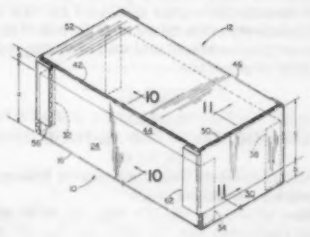
1. An article consisting essentially of a ductile brazing alloy foil, said alloy having a composition consistng essentially of from about 0.25% to about 5% by weight of a reactive metal, selected from the group consisting of titanium, vanadium, zirconium and mixtures thereof, from about 50% by weight to about 98.75% by weight of copper and from about 1% to about 45% by weight of a third metal selected from the group consisting of silicon, tin, germainium, manganese, nickel, cobalt and mixtures thereof wherein said alloy has a liquidus temperature of from about 870° C. to about 1170° C.

4,426,034

TWO PIECE PACKING CASE

Thomas L. Flanagan, Killingworth, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.

Filed Aug. 16, 1982, Ser. No. 408,222
Int. Cl.³ B65D *13/00*, *5/68*
U.S. Cl. 229—23 BT 12 Claims



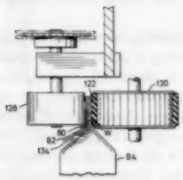
1. A packing case for a product array of height "h" having M rows of N columns, said case comprising a tray formed from a flat blank which has a bottom panel to support the product in said array, and said tray blank having pairs of side and end panels integrally connected along fold lines at right angles to said bottom panel, one of said pairs of panels having tray flaps adapted to abut the other of said pairs of panels when said blank is folded and glued, said side panels having a height "a" less than the height "h" of the product and said end panels having a height "b", and said case including a top portion received on said tray, said top portion also formed from a flat blank and having a top panel adapted to cover the product in said array, and said top portion blank having pairs of side and end panels integrally connected along fold lines at right angles to said top panel, one of said pairs of panels of said top portion having top flaps adapted to abut the other of said pair of panels when said blank is folded and glued, said end panels of said top portion having a height "c" less than the height "h" of the product so that the lower marginal edges of said top portion end panels abut the upper marginal edges of said tray end panels, said side panels of said top portion having a height "d" such that the lower marginal edges thereof abut the upper marginal edges of said tray side panels, and the combined heights of said end panels ("b"+"c") being approximately equal to the product height "h" and to the combined heights ("a"+"d") of said side panels.

4,426,035

PACKAGING

Klaus-Peter Dieckow, Unionville, Canada, assignor to Hammex Machines Ltd., Markham, Canada

Filed Mar. 10, 1981, Ser. No. 242,321
Claims priority, application United Kingdom, Mar. 13, 1980, 800836
Int. Cl.³ B65D 77/14, 77/30
U.S. Cl. 206—526 10 Claims



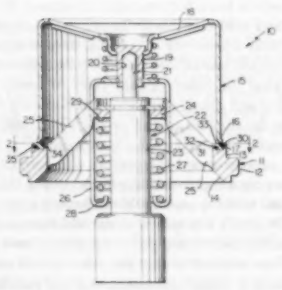
6. A reclosable package comprising a filled bag formed at a top end with a bag neck in which side walls of the bag are brought into parallel juxtaposition, the neck being formed with at least one fold such that a folded over portion of the top of the bag overlies a portion of one of its side walls, and closure strip means extending parallel to the width of and substantially coextensive with the folded over portion, the closure strip means comprising a first flexible strip coated on one surface with a non-setting adhesive and a second flexible strip, without a non-setting adhesive coating and overlapped by and adhered to one marginal edge portion of the adhesive coated surface of the first strip, the other marginal portion and an intermediate portion of the adhesive coated surface of the first strip being adhered respectively to the folded over portion of the neck and to an adjacent portion of said side wall of the bag not overlaid by said folded over portion.

4,426,036

VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Boyd P. Sliger, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 888,015, Mar. 20, 1978, abandoned.
This application Aug. 12, 1982, Ser. No. 407,503
Int. Cl.³ F01P 7/02
U.S. Cl. 236—34.5 2 Claims



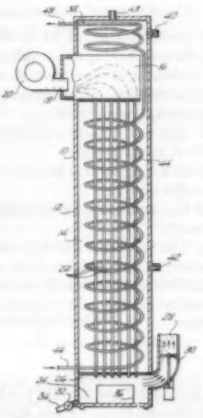
1. In a valve construction having a valve seat and a movable valve member for opening and closing said valve seat and being operatively interconnected to a thermal power element carried by said valve construction, said valve member having a relatively narrow annular edge for closing against said valve seat in a direction substantially perpendicular to said valve seat, an annular flexible elastomeric insert being carried by said valve seat and being wider than said annular edge of said valve member whereby said annular edge of said valve member closes against said annular flexible elastomeric insert within the inner and outer peripheral edges thereof to close said valve seat, the improvement wherein said edge of said valve member is turned to present a knife-edge to said insert and an arcuate annular surface on said valve member that begins at said knife-edge and is inboard of said knife-edge and has its convex side facing said insert.

4,426,037

BOILER FOR A HEATING SYSTEM, AS AN ARTICLE OF MANUFACTURE, A BOILER-HEATING SYSTEM COMBINATION, AND A METHOD FOR HEATING A HEAT-TRANSFER MEDIUM SUCH AS WATER IN A HEATING SYSTEM

Lennart Bernstein, Appartemento numero 29, El Pinzon Real, Guadalmina Alta, San Pedro de Alcantara (Marbella), Spain

Continuation-in-part of Ser. No. 299,175, Sep. 3, 1981, which is a continuation of Ser. No. 67,190, Aug. 17, 1979, abandoned.
This application May 13, 1982, Ser. No. 377,930
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1978, 2837004
Int. Cl.³ F24D 3/08; F24H 1/22
U.S. Cl. 237—19 28 Claims



1. As an article of manufacture, a boiler for heating a heat-transfer medium for one use and another heat transfer medium for another use, comprising:

a combustion chamber within which combustion takes place in a direct heat transfer relationship within a heat transfer medium;

a vessel for containing said heat transfer medium and said combustion chamber;

an interconnecting outlet from said vessel for interconnecting a heating system with said heat transfer medium;

an interconnecting inlet for said vessel, for interconnecting said heating system for return of said heat transfer medium to said vessel;

a heat transfer conduit for said another heat transfer medium within said heating vessel, said heat transfer conduit having heat transfer conduit inlet and outlet interconnecting means at the lower and upper portion, respectively, of said vessel for heat transfer mediium, said inlet interconnecting means for said heat transfer conduit positioned below said combustion chamber and below said interconnecting inlet for said heat transfer medium for said heating system, and said outlet interconnecting means above said combustion chamber;

a plurality of downcoming smoke tubes interconnecting with said combustion chamber,

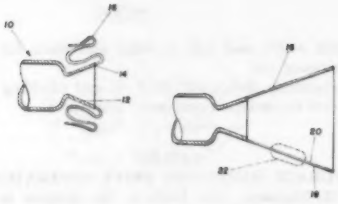
a lower chamber interconnecting with said combustion chamber via said smoke tubes and a chimney and said heat transfer conduit inlet interconnecting means proximate to said lower chamber and extending through said vessel for said heat transfer medium.

4,426,038

NON-RADIATING EXTENDIBLE CLOTH EXIT CONE FOR ROCKET NOZZLES

Frank S. Inman, and Joseph E. Pelham, both of Brigham City, Utah, assignors to Thiokol Corporation, Chicago, Ill.

Filed Jan. 11, 1982, Ser. No. 338,713
Int. Cl.³ B64D *33/04*
U.S. Cl. 239—265.15 **14 Claims**



1. An auxiliary nozzle portion for a rocket motor having a combustion chamber provided with a rearwardly directed outlet and a rearwardly extending nozzle defining the outlet of the combustion chamber, comprising,

a woven refractory cloth structure having an exterior surface and an interior surface and having the shape of a frustum of a cone, and

a refractory felt sewn to the exterior surface of said cloth structure,

said cloth structure being secured at the smaller end thereof to the rocket nozzle and being folded upon itself in an inoperative folded configuration,

said cloth structure when deployed from said inoperative configuration to an operative configuration forming a frustoconical rearward extension of the rocket nozzle,

said cloth structure being the primary supporting structure, when deployed, for transmitting the rocket motor thrust forces to the rocket nozzle, and

said refractory felt providing thermal insulation for said structural cloth thereby to prevent thermal radiation from said auxiliary nozzle portion.

4,426,039

SPRAY GUN CONTROL VALVE

Kui C. Kwok, Arden Hills, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Jan. 11, 1982, Ser. No. 338,424
Int. Cl.³ B05B *7/12*
U.S. Cl. 239—415 **12 Claims**

6. In a spray gun of the type having a general pistol shape with a liquid inlet into a barrel and an air inlet into a handle, and where the barrel lies along an axis and the handle lies along an axis approximately mutually perpendicular and intersecting to the axis of the barrel, the improvement comprising

(a) a first passage through the spray gun parallel to said barrel axis and intersecting said liquid inlet;

(b) a second passage in the handle of said spray gun parallel to said handle axis and intersecting said first passage, and communicating with said air inlet;

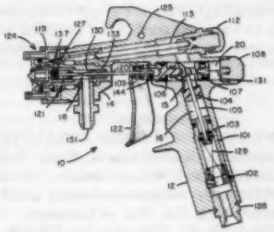
(c) a liquid valve in said first passage having a liquid actuating stem extending along said first passage toward said handle;

(d) an air valve in said second passage having an air actuating stem extending along said second passage toward the intersection of said barrel axis and said handle axis;

(e) a spool slidable in said first passage, said spool having a recess for accepting said liquid actuating stem and having a tapered portion engageable against said air actuating stem

(f) a mechanical stop attached to said liquid actuating stem in said recess;

(g) a first compression spring in said first passage urging said spool toward said liquid valve;



(h) a second compression spring in said first passage urging said liquid valve away from said spool;

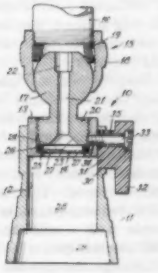
(i) a trigger pivotally attached to said barrel, said trigger being firstly engageable against said slidable spool to cause movement of said spool along said barrel axis and consequent movement of said air actuating stem along said handle axis, said trigger being secondly engageable against said mechanical stop to cause movement of said liquid actuating stem along said barrel axis.

4,426,040

ADJUSTABLE AERATING SHOWER HEAD

Lewis L. Smith, 171 Shadywood La., Elk Grove Village, Ill. 60007

Filed Jun. 4, 1981, Ser. No. 270,376
Int. Cl.³ E03C *1/08, 1/084*
U.S. Cl. 239—428.5 **5 Claims**



1. In a showerhead comprising a body having an axial outlet passageway therein, a nozzle plate arranged coaxially and normal to said passageway at the inlet end thereof, said nozzle plate having a cluster circle of orifices therein, and means forming an inlet passageway coaxially with said outlet passageway and upstream of and opening toward said nozzle plate, the diameter of said outlet passageway being greater than the diameter of said cluster circle, the improvement therein comprising a thin walled nozzle plate having sharp-edged orifices each capable of providing a high velocity atomized jet of water emitting therethrough into said outlet passageway; said nozzle plate being held coaxially and normal to said inlet passageway;

the total cross-sectional area of said orifices being less than the cross-sectional area of any upstream water passageway, whereby the nozzle plate provides the basic flow restriction; the outlet passageway having a length sufficient to enable a suction to be created immediately downstream from the nozzle plate; and means for drawing air into said outlet passageway immediately downstream of the nozzle plate, whereby to aerate the atomized water jets; said outlet passageway further being of a length sufficient to direct the aerated water into a uniform spray pattern emitting therefrom at an outlet opening thereof having a sharp-edged annular shoulder defining said outlet opening; and externally manipulable means for axially varying the position of said nozzle plate axially relative to said body to correspondingly vary the length of said outlet passageway whereby to vary and control the included angle characteristic of the spray pattern and the water content concentration.

4,426,041

SOLID-CONE JET NOZZLE FOR SPRAYING LIQUIDS

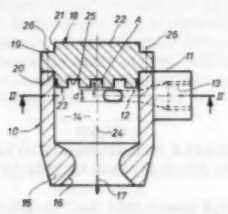
Wolfgang Nieuwkamp, Kappishäusern; Dieter Kröger, St. Johann/Bleichstetten, and Werner Raissle, Metzingen, all of Fed. Rep. of Germany, assignors to Lechler GmbH & Co. KG, Baden-Wuerttemberg, Fed. Rep. of Germany

Filed Jun. 25, 1981, Ser. No. 277,138

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024472

Int. Cl.³ B05B *1/34*

U.S. Cl. 239—468 **16 Claims**



1. A solid-cone jet nozzle, comprising:

a. an open ended cylindrical housing having a central longitudinal axis and including a turbulence chamber therein;

b. said chamber having an inner annular wall;

c. inlet means for said chamber, said inlet means substantially tangential to said chamber;

d. a turbulence chamber bottom spaced from said inlet means and closing one end of said housing and having a number of sized shaped spaced elevations axially extending therefrom into said chamber, at least a portion of said number spaced from said inner annular wall; and,

e. flaring nozzle means co-axially positioned on said housing opposite said bottom whereby fluid entering said chamber is rotationally oriented and interacts with said elevations to exit said nozzle with a solid-cone pattern having a substantially axial orientation.

4,426,042

METHOD OF SHREDDING SOLID WASTE

Eugene E. Hively, Emigsville, Pa., assignor to Mineral Processing Systems, Inc., York, Pa.

Filed Oct. 16, 1980, Ser. No. 197,648

Int. Cl.³ B02C *25/00*

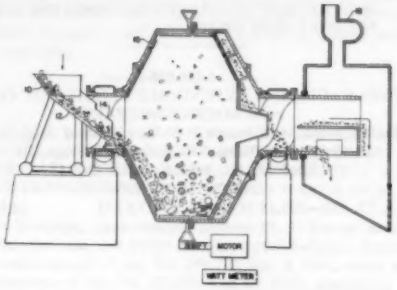
U.S. Cl. 241—21 **1 Claim**

1. A method for shredding municipal solid waste including the steps of:

(a) contacting said waste with moisture in a collecting bin to maintain the moisture content of said waste between 25–35 percent by weight;

(b) introducing said waste from said bin into a tumbling mill, said tumbling mill having a diameter to length ratio of from 2.5:1 to 3:1;

(c) causing said waste to contact irregular shaped shredding



media within said mill to shred said waste for further processing and

(d) monitoring the power draw of said tumbling mill to control the moisture content of said waste.

4,426,043

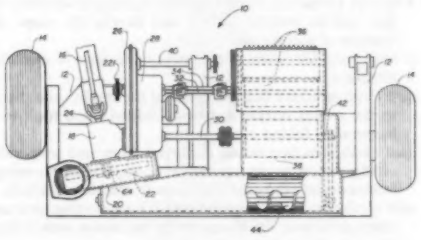
FORAGE HARVESTER DRIVE APPARATUS

Wayne B. Martenas, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Feb. 16, 1982, Ser. No. 349,436

Int. Cl.³ B02C *18/24*

U.S. Cl. 241—101.2 **5 Claims**



1. In a forage harvester having a cutterhead for cutting crop material, and feed means for feeding crop material to said cutterhead, said feed means comprising pairs of cooperating upper and lower feedrolls, drive apparatus comprising

a first and second gearbox each having an input,

a first output of said first gearbox being said input of said second gearbox,

means connected to said second gearbox input for driving said cutterhead,

a planetary gear set operably mounted inside said second gearbox,

means inside said second gearbox for operably interconnecting said second gearbox input and said planetary gear set,

a drive member mounted in said second gearbox and a portion of said drive member extending outside said second gearbox, said drive member and said planetary gear set being interconnected inside said second gearbox,

an upper feedroll drive shaft having a portion extending from said second gearbox and operably connected to said upper feedrolls,

another portion of said upper feedroll drive shaft extending from said second gearbox, said another portion and said drive member being interconnected outside said second gearbox,

a lower feedroll drive shaft connected to said lower feedrolls, said upper and lower feedroll drive shafts being interconnected inside said second gearbox, and

an attachment drive shaft extending from said second gearbox, said attachment drive shaft and said drive member being interconnected inside said second gearbox.

4,426,044

DOCUMENT SHREDDING MACHINES

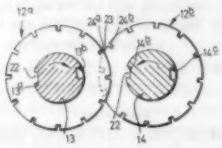
George T. Butler, Leigh, England, assignor to Frank R. Ford Limited, Westbank, England

Continuation-in-part of Ser. No. 756,389, Jan. 3, 1977, abandoned. This application Jul. 25, 1978, Ser. No. 927,920

Claims priority, application United Kingdom, Jan. 2, 1976, 476

Int. Cl.³ B02C *18/18*

U.S. Cl. 241—236 **5 Claims**



1. In a document shredding machine comprising:

a cutter assembly including a plurality of cutter discs arranged in two parallel rows, the discs of one row entering the gaps between the discs of the other row so as to cooperate therewith, first and second parallel shafts on which said discs are each separately mounted; keying means on said discs and said shafts, means for rotating said shafts and thereby said discs in opposite directions about their longitudinal axes and causing said discs to sever material fed between the rows into strips, and notches formed in the periphery of each disc to divide such strips into short lengths,

the invention wherein:

said discs are arranged in a plurality of groups of first, second, third and fourth axially successive discs wherein in each of said groups of said first and third discs are mounted on said first shaft and of said second and fourth discs are mounted on said second shaft, said notches on said discs being circumferentially staggered in relation to each other such that upon rotation of said shafts, a notch on one of said first and third discs will enter the nip of the cutter assembly followed by a notch on one of said second and fourth discs, followed by a notch on the other of said second and fourth discs, followed by a notch on the other of said first and third discs sequentially.

4,426,045

BAIL TRIP MECHANISM FOR FISHING REEL

Richard L. Gifford, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 85,926, Oct. 18, 1979, abandoned. This application Dec. 22, 1981, Ser. No. 333,343

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 G **24 Claims**

1. In an open faced spinning reel used for casting a bait attached to a fishing line and for retrieving the bait and fishing line after casting,

(1) the reel having a housing with a front forward spool end face, a back end and a central passageway extending from the face to the back end defining a central axis,

(2) a pinion assembly mounted in the housing,

(3) a center shaft rotatably mounted in the housing and coaxial with the central axis,

(4) a spool mounted on the shaft for holding the fishing line,

(5) a handle and gear train assembly mounted in the housing,

(6) a rotor having a movable bail for winding the fishing line about the spool in the retrieving position being coaxial with the central axis, mounted adjacent the face of the housing and rotatable by cooperative movement of the gear train and pinion assemblies,

(7) the movable bail mounted on the rotor having an open casting position and a closed retrieving position,

the improvement being an internally mounted mechanism for automatically changing the bail from the casting position to the retrieving position comprising:

(a) a first cam mounted on the forward face of the housing coaxial with the central axis;

(b) the rotor comprising:

(1) a central deck having a front opening cylinder extending toward the front end of the reel and a back opening cylinder extending toward the back of the reel having an internal bowl and an external surface,

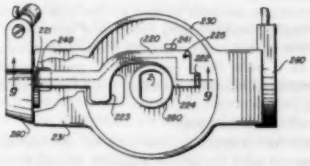
(2) first and second L-shaped ears secured to the exterior surface of the back cylinder and directed toward the front of the reel, the first ear having an L-shaped cavity and a radial pasageway connecting the cavity with the internal bowl,

(3) the rotor bowl surrounding the first cam defining a rotor pocket,

(4) a raised hub extending from the deck toward the back of the reel and inside the internal bowl;

(c) the bail being U-shaped with two ends;

(d) first and second bail arms, each one of the bail arms being mounted in one bail arm, the first bail arm pivotally biasa-



bly mounted in the first ear and the second arm pivotally mounted in the second ear to permit rotation of the bail from the casting position to the retreive position, the first bail arm having a second cam and a trip ramp projecting into the L-shaped cavity;

(e) Z-shaped elongated trip lever means slidably mounted on the deck in the rotor pocket and having a cam follower in the internal bowl adjacent the first cam and a trip end extending into the cavity of the first ear adjacent the second cam and trip ramp, the lever means being substantially perpendicular to the central axis and having a cut out section through which the hub extends, the cut out section defining a stop for engagement with the hub when the trip end is out of engagement with the first cam and trip ramp;

(f) means for biasably urging the cam follower towards the central axis and the trip end against the second cam and trip ramp;

(g) in the retrieving position the second cam depressed the trip end radially inwardly toward the axis overriding the biasably urging means and moving the cam follower radially outwardly from the central axis;

(h) in the casting position the trip end is urged radially outwardly from the central axis by the biasably urging means and seated against the trip ramp locking the bail open for casting and moving the cam follower radially inwardly toward the central axis;

(i) rotation of the rotor when the bail is open or in the casting position causes the cam follower to contact the first cam and rapidly move outwardly from the central axis with the trip end concomitantly being withdrawn from against the

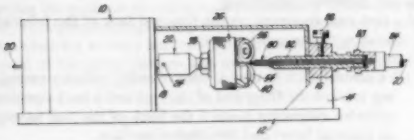
trip ramp unlocking the bail permitting the bail arms to pivot the bail to the closed retrieve position.

4,426,046

WIRE DRIVE SYSTEM

Carl C. Heuckroth, 101 Hemlock Dr., Lodi, Ohio 44254

Filed Oct. 2, 1981, Ser. No. 307,902
Int. Cl.³ B65H *51/10, 57/00*
U.S. Cl. 242—181 **6 Claims**



1. A wire drive mechanism of the type including a rotatable head having an axis of rotation, a wire receiving passage extending through said head and having an axis coincident with said axis of rotation, wire engaging rollers rotatably mounted on said head and having rotative axes radially offset on generally opposite sides of said passage axis, each roller having a concave and continuous outer wire engaging surface, means urging said concave roller surfaces into engagement with a wire, the rotative axes of said rollers being inclined to each other causing said concave surfaces to be disposed at an angle to each other whereby as said rollers rotate with said head about the passage axis a longitudinal motion is imparted to a wire commonly engaged by said roller surfaces, the improvement comprising:

a. the concave surfaces of said rollers coacting to peripherally engage and laterally offset said wire from the axis of rotation of said head whereby the wire is eccentric to said axis as it exits from said rollers, such eccentricity and longitudinal motion imparting a vibratory motion to said wire;

b. a flexible conduit; and

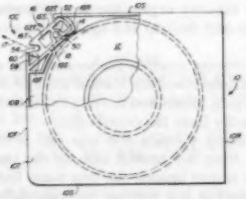
c. means for supporting one end of said conduit in axial alignment with the axis of rotation of said head, the other end of said flexible conduit being free and terminating adjacent said head and receiving said wire, the free end of said flexible conduit being laterally offset from said axis by and adapted to vibrate with said wire.

4,426,047

SINGLE REEL TAPE CARTRIDGE

Maurice E. Richard, and Daniel J. Winarski, both of Tucson, Ariz., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,440
Int. Cl.³ G11B *23/04, 15/32;* **G03B** *1/56*
U.S. Cl. 242—197 **20 Claims**



1. A magnetic tape cartridge comprising:

an approximately square box having two elongated side pieces, elongated leading edge and rear edge pieces, all interconnecting nearly flat top and bottom sections, with a tape access opening to the interior of the cartridge at one corner of the leading edge and one side piece, and a drive means opening in the bottom section of the box, the tape access opening including a leader block receiving well;

a reel positioned at the approximate center of the box to be accessed for rotation at said drive means opening;

a web of magnetic tape wound on said reel and having a free end;

a leader block having a cutout section in one side of said leader block approximate to its rear surface for attaching the free end of said web, said leader block of a size for capture in the tape access opening in the box in the leader block receiving well;

connection means formed in said leader block for permitting threading of said leader block through a tape drive and thereby unreeling said magnetic tape for utilization in the tape drive; and

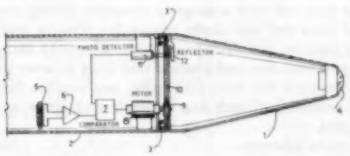
at least one compliant section in said leader block formed adjacent to the rear surface and the side surface of said leader block containing said cutout section, the compliant section of the leader block enabling the rear surface to provide a smooth circumferential surface for subsequent layers of magnetic tape.

4,426,048

STABILIZING A ROTATING BODY

Michael T. Mildren, St. Peters, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

Filed Sep. 18, 1981, Ser. No. 303,503
Claims priority, application Australia, Sep. 22, 1980, PE5681
Int. Cl.³ F42B *15/14*
U.S. Cl. 244—3.23 **7 Claims**



1. The method of stabilising a platform in relation to a body with relative spin therebetween, comprising rotationally supporting the platform from the body about a spin-correcting axis, sensing the motion of the body about the said axis and generating a signal proportional to such motion, driving the platform about the spin-correcting axis, sensing relative rotation of the platform and body and generating a signal proportional to such rotation, and controlling the drive in accordance with said signals.

4,426,049

DUAL PROPELLER AND ENGINE DRIVE SYSTEM FOR AIRCRAFT

Donald M. Stewart, 11420 State Rte. 165, Salem, Ohio 44460

Filed Jul. 31, 1981, Ser. No. 288,733
Int. Cl.³ B64C *11/48;* **B64D** *27/00, 35/06*
U.S. Cl. 244—69 **11 Claims**

1. A drive system for an aircraft including:

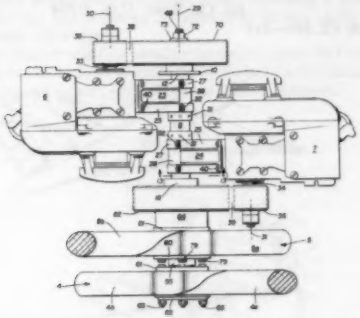
(a) elongated longitudinally extending support means adapted to be mounted on a frame of an aircraft for operatively supporting all of the components of the drive system thereon, said support means including a fixed outer sleeve and an inner shaft rotatably mounted within said outer sleeve, said outer sleeve and inner shaft each having an extended end;

(b) first and second propellers, said first propeller being rotatably mounted on the extended end of the fixed outer sleeve and said second propeller being mounted on the

extended end of the shaft in close proximity to said first propeller;

(c) first and second engines;

(d) bracket means for mounting the first and second engines on the support means;



(e) drive means mounted on the support means and operatively connected to each of the engines and respective propellers for drivingly connecting each of the propellers with its respective engine to rotate said propellers in opposite directions with respect to each other; and

(f) means for mounting the elongated support means on the frame of an aircraft.

4,426,050

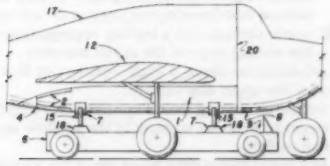
DROPOUT FUEL TANKS AIRCRAFT

Alvin L. Long, Civilian General Delivery, Beale A.F.B., Calif. 95903

Continuation-in-part of Ser. No. 71,784, Oct. 26, 1979, abandoned. This application Apr. 13, 1981, Ser. No. 253,087

Int. Cl.³ B64D 37/12

U.S. Cl. 244—135 R **3 Claims**



1. An aircraft comprising wings, fuselage, auxiliary fuel tanks on the wings and a main dropout fuel tank releasably mounted on and forming a portion of said aircraft and having catapulting means mounted on said main dropout fuel tank;

horizontal track means on said aircraft for mounting said main dropable tank and running longitudinally of said aircraft, said catapulting means mounted on said main tank for ejecting said main tank rearwardly along said track means, said catapulting means being operated from the pilot's cabin and comprising airfoils pivotally mounted to said main tank and further comprising parachute means connected to said airfoil means for deploying said air-foil means to forceably eject said main tank away from said aircraft;

said auxiliary fuel tank containing sufficient fuel to operate said aircraft for a safe landing after said main tank has been ejected;

external control means on said aircraft for externally releasing said main fuel tank on the ground so that said aircraft can be refueled by replacement with another dropable main fuel tank filled with fuel.

4,426,051

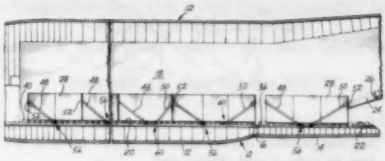
AIRCRAFT CONTAINER DELIVERY SYSTEM HAVING A POSITIVE RELEASE GATE

Eddie D. Banks, Renton; Gerald C. Simmons, Bothell, and Roger F. Roberts, Auburn, all of Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Apr. 13, 1981, Ser. No. 253,189

Int. Cl.³ B64D 1/10

U.S. Cl. 244—137 R **13 Claims**



1. For use in an aircraft, releasing gates in a container delivery system in which the containers are secured forwardly and rearwardly by straps extending across the containers from one athwartship aircraft portion to another, and in which the containers are dropped out of a rear door when the door is opened and the containers are released by opening the gates, one gate securing one end of a rearwardly holding strap so that the one end of the strap is freed to allow respective containers to move rearwardly on rollers in the aircraft deck when the respective gate is opened,

each gate comprising:

a support member adapted to be secured to an aircraft subfloor;

a motor pivotally secured adjacent one end to said support member and adapted to extend upwardly therefrom toward and below an aircraft floor;

a rod extending from the other end of said motor, said motor being adapted to reciprocate said rod predetermined amounts;

a bell crank-shaped link pivotally supported intermediate its ends on a fulcrum, said fulcrum being supported by means adapted to be supported on said subfloor;

said rod having its end extending from said motor pivotally engaged with one end of said link;

a link roller secured adjacent the other end of said link and extending transversely thereto; and

a gate pivot member pivotally secured on means adapted to be secured on said subfloor;

said gate pivot being pivotal from a gate open position below the floor level to a gate closed position extending above the floor level;

said rod being adapted to pivot said link from a gate unlocked position to a gate locked position, when said gate pivot is in the closed position, by moving said roller against said gate pivot above the floor level.

4,426,052

PROCESS AND DEVICE FOR ALIGNING THE ROLL AXIS OF A SATELLITE WITH A DESIRED DIRECTION

Bernard Hubert, and Bernard Blancke, both of Le Cannet Rocheville, France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jul. 21, 1982, Ser. No. 400,389

Claims priority, application France, Sep. 28, 1981, 81 18245

Int. Cl.³ B64G 1/36, 1/44

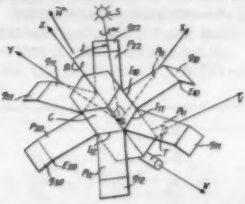
U.S. Cl. 244—168 **7 Claims**

1. A device for controlling the roll axis of a rotating artificial satellite relative to the sun within an angle of 60°, said satellite having a plurality of radial solar panels, at least some of which are provided at their outer extremities with angularly movable control surfaces responsive to solar pressure, said device comprising:

an electromagnetic motor associated with each of said control surfaces for controlling its angular position relative to its associated solar panel;

means including detecting, filtering, control logic, and am-

plifying means for generating and supplying to said motors cyclic actuating currents dependent on errors of position or angular velocity of said satellite, whereby each said motor causes its associated control surface to vary its



angular position during rotation of said satellite in a direction to reduce said errors; and

detecting means associated with each motor for detecting the angular speed of the associated control surface and introducing a damping in the control of said surface.

4,426,053

MECHANICAL RELEASE DEVICE FOR EXAMPLE FOR SATELLITE

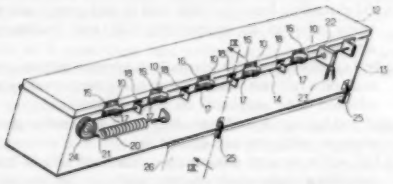
Claude Chenin; Rodolphe Krawczyk, both of Cannes la Bocca; Georges Marello, Mandelieu, and Jean-Yves Lombard, Le Cannet, all of France, assignors to Societe Nationale Industrielle Aerospatiale, France

Filed Mar. 2, 1982, Ser. No. 354,256

Claims priority, application France, Mar. 3, 1981, 81 04195

Int. Cl.³ B64G *1/44*

U.S. Cl. 244—173 **6 Claims**



1. A mechanical release device especially applied to the displaying of solar panels for a satellite, when they are stored between two members secured edge to edge to one another, said device comprising:

a motive mechanism;

at least one bonding element disposed on the lip of each of said edges of said members;

at least one flexible junction element applied to said bonding elements;

an element for automatically progressively raising said flexible element under the action of said motive mechanism;

a container for said solar panels, connected to said satellite and carrying a hinge on the one side and at least one of said housing elements on the other side on the outer edge;

a cover hingedly mounted to said hinge on the one side, and on the other side carrying at least one of said bonding elements on the outer edge;

a plurality of said flexible junction elements being applied thereon;

a cable for coordination of all ends not applied thereto of said flexible elements and progressive raising elements;

an electric cable cutter; said cable being to this end connected at one of its ends to said motive mechanism connected to said container and on its other end to another portion of said container, said electric cable cutter being disposed adjacent said other end; the arrangement of said elements being such that operation of said cable cutter provokes as soon as said cable is cut the simultaneous peeling of all said bonding elements thereby also causing mechanical release of said cover and said container, as soon as said flexible elements have come off.

4,426,054

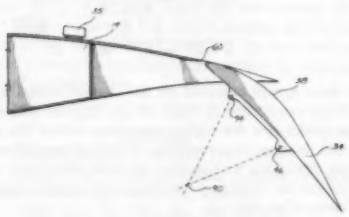
UPPER SURFACE BLOWN POWERED LIFT SYSTEM

Timothy Wang, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 115, Jan. 2, 1979, abandoned. This application Nov. 12, 1980, Ser. No. 206,172

Int. Cl.³ B64C *3/38, 21/04*

U.S. Cl. 244—212 **18 Claims**



1. An upper surface blown powered lift system comprising:

a. an airfoil assembly having a chordwise axis and a leading edge and a trailing edge, said airfoil assembly providing a substantially continuous upper aerodynamic surface, said airfoil assembly comprising:

1. an airfoil having an upper airfoil surface that has a leading edge and a trailing edge and forms a forward portion of said upper aerodynamic surface,

2. a flap means having an extended position extending downwardly and rearwardly from the trailing edge of the airfoil, with said flap means having an upper flap surface that forms a rear portion of said upper aerodynamic surface, and a trailing edge portion which forms the trailing edge of the airfoil assembly,

b. jet means to direct a high velocity jet flow rearwardly over the upper flap surface,

c. vortex generating means mounted rearwardly of said jet means to produce vortices in the jet flow over the upper flap surface,

d. said upper flap surface being curved in a generally chordwise direction and having a forward upper flap surface portion and a rear upper flap surface portion, said forward flap surface portion being curved in a relatively tight curve with a substantially uniform radius of curvature, said rear upper flap surface portion being curved in a more relaxed curve having a greater radius of curvature, said upper flap surface being characterized in that a forward half of the upper flap surface has a total degree of curvature greater than that of a rear half of said upper flap surface and causes greater deflection of said jet flow than the rear half of the upper flap surface.

4,426,055

PRECISION TRANSLATOR

Robert P. Reedy, and Daniel W. Crawford, both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

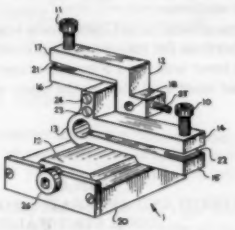
Filed Mar. 9, 1982, Ser. No. 356,568

Int. Cl.³ F16M *11/12*

U.S. Cl. 248—184 **4 Claims**

1. An apparatus for precisely positioning and maintaining alignment of an object, which comprises:

a pair of rigidly connected tuning fork-like members;
a first of said pair of members having first and second prongs;
a second of said pair of members having a third prong rigidly attached to said second prong of said first member and a fourth prong provided with means including a hole for inserting and retaining an associated object to be positioned and aligned;
the prongs of said first member having an outer end extending in a direction substantially opposite to a direction of an outer end of said prongs of said second member;



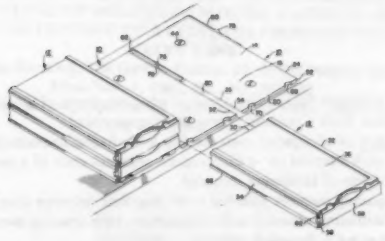
a mounting fixture having a movable base to which said first of said pair of members is rigidly attached for preliminary positioning an associated object;
first adjusting means on said first of said pair of members for adjusting the spacing between said first and second prongs so that said hole is moved in a first direction; and
second adjusting means on said second of said pair of members for adjusting the spacing between said third and fourth prongs so that said hole is moved in a second direction substantially perpendicular to said first direction.

4,426,056

PLATE BRACKET FOR MOUNTING A CASSETTE BOX

Anthony L. Gelardi; Paul J. Gelardi, both of Cape Porpoise, and Robert B. MacLeod, Jr., Biddeford, all of Me., assignors to Shape Inc., Biddeford, Me.

Filed Mar. 31, 1981, Ser. No. 249,681
Int. Cl.³ A47B *96/06*
U.S. Cl. 248—225.1 **20 Claims**



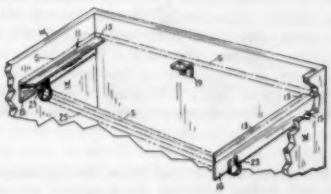
10. A flat bracket for mounting a cassettebox having interconnect means formed along the bottom side edges thereof, said bracket comprising:
(a) a flat substantially thin rectangular plate member attachable to a table, shelf or other like surface and having outer length and width dimensions equal to or less than the outer length and width dimensions of the bottom of said cassettebox container for slidable and detachable connection thereto;
(b) interconnect means formed along the side edges of said flat plate member for mating with the corresponding interconnect means of the cassettebox, wherein the cassettebox is held on top of said flat plate member; and
(c) alignment and locking means formed along the side edges of said flat plate member for positioning a flat plate member of another flat mounting bracket in side engaging alignment thereto, wherein the cassetteboxes held on adjacent mounting brackets are aligned with each other in side-by-side relationship,
and wherein said flat plate member, interconnect means, and alignment and locking means are formed of a single integral piece of molded material.

4,426,057

COMBINED SHELF-SUPPORTING BRACKET AND CLOTHES-ROD SUPPORT

Alexander S. Nudo, 2508 S. Grand Ave. East, Springfield, Ill. 62707

Filed Mar. 15, 1982, Ser. No. 358,517
Int. Cl.³ A47F *5/00*
U.S. Cl. 248—235 **5 Claims**



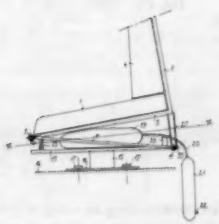
1. A combined shelf-supporting bracket and support for a clothes-hanger rod, comprising: a section of rigid right-angled angle-bar having a horizontal shelf-supporting web and a depending vertical wall-attachable web, said vertical web having a pair of struck-out tongues, and a sling-like member having opposed ends with recess means therein, said ends being slidably engageable over said tongues for being readily removed therefrom, said sling-like member being sized to form a cradle-like support for the end of a horizontal rod for supporting clothes hangers.

4,426,058

PNEUMATIC SUSPENSION FOR VEHICLE SEAT

René P. Le Forestier, 56480 Ruéo en Clégueree, France

Filed Feb. 17, 1981, Ser. No. 234,596
Claims priority, application France, Feb. 21, 1980, 80 04121
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—594 **12 Claims**



1. A pneumatic suspension system for a vehicle seat, said system comprising a first horizontal plate for supporting the weight of a person sitting in said seat, and a second horizontal plate for attachment to a chassie formed by a structural member of said vehicle, at least one first pneumatic spring enclosure positioned between the first and the second plates thereby providing an air spring suspension, the first plate being connected to the second plate by two lateral arms, bearings affixed to the rear of the second plate and to the front of the first plate, rods formed at the ends of the arms for rotation in said bearings, the front part of the first plate being connected to the front of the second plate by means of at least one sway controlling solid resilient silent-block which is generally located under

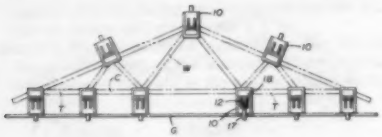
the knees of a person sitting in the seat, wherein there are two of said pneumatic enclosures communicatingly interconnected by a tube, the second of said enclosures being located in an unloaded area, whereby air in said first enclosure is displaced to said second enclosure responsive to the weight of a person sitting on said seat.

4,426,059

VACUUM MOUNTING SUPPORT FOR A ROOF TRUSS FORMING MACHINE

Edgar A. Mort, 128 College La., Poland, Ohio 44514

Filed Apr. 6, 1981, Ser. No. 251,315
Int. Cl.³ F16M *1/00*
U.S. Cl. 248—637 **5 Claims**



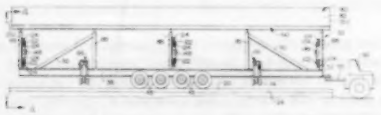
1. An improvement in a roof truss forming machine for assembling and nailing with nail plates timbers into a planar roof truss, a jig frame support forming a portion of said machine, the improvement comprising means for attaching said machine to a supporting surface such as a floor, said means for attaching said machine to a supporting surface such as a floor including means on said machine movably engaging said supporting surface, an air impervious horizontally disposed member in the lower portion of said jig support frame arranged in closely spaced relation to said floor, endless inflatable means on said air impervious member defining a large area thereon and selectively engagable with said floor for defining an enclosure in which a partial vacuum may be formed, means for partially evacuating said enclosure so as to form a partial vacuum whereby said jig frame support of said roof truss machine may be secured to said floor.

4,426,060

APPARATUS AND METHOD FOR CONSTRUCTING MODULAR CONCRETE SHELL HOUSING UNITS

Ernest Csont, 1941 - NW. 36th St., Oakland Park, Fla. 33309

Filed Jun. 1, 1981, Ser. No. 269,323
Int. Cl.³ E04G *11/02*
U.S. Cl. 249—13 **44 Claims**



1. Apparatus for constructing an integrally formed concrete shell housing unit having side walls and roof sections on a preforming hardened concrete floor slab, said apparatus including a pair of complementary form assemblies having structural framing portions, and means detachably connected to each said form assembly at the ends thereof for drawing said form assemblies onto said floor slab into transversely aligned parallel contiguous relationship and for removing said assemblies from said floor slab, said apparatus characterized by the improved combination comprising

(a) said form assemblies being detachably connected together substantially longitudinally medially of said floor slab at their adjacent structural framing portions to compose a unitary apparatus,

(b) a unitary roof form affixed to and supported by each of said framing portions,

(c) pivoting roof edge plate sections hingedly mounted on the outer lateral distal edge of said roof form,

(d) wheeled means operably mounted on each of said framing portions for moving, elevating, leveling, supporting and lowering said framing portions and said roof form relative to said floor slab,

(e) an inner wall form movably supported on each of said framing portions and translatable horizontally from an inner position with respect to said framing portions to an outer position under and in supporting contiguous relationship with the distal edge of said pivoting roof edge plate sections,

(f) means affixed to and operatively supported on said framing portions for translating said inner wall form,

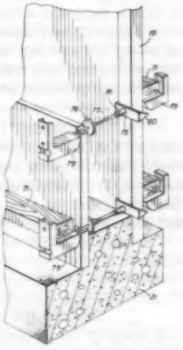
(g) and inner wall form bottom sections removably attached to said inner wall form at the lower edge portion thereof.

4,426,061

METHOD AND APPARATUS FOR FORMING INSULATED WALLS

John R. Taggart, 100 NE. 6th St., Lot 221, Homestead, Fla. 33030

Filed Aug. 4, 1980, Ser. No. 174,849
Int. Cl.³ E04G *11/06, 17/06*
U.S. Cl. 249—45 **8 Claims**



1. A device for spacing a pair of adjacent sheets of insulating material from a concrete form sheet comprising:

a pair of elongated caps having a U-shaped cross section, each adapted to be disposed on adjacent ends of a pair of sheets of insulating material;

a spacing member adapted to be disposed between sheets of insulating material and a form sheet, such spacing member having a threaded opening at each end;

a bracket disposed adjacent to said spacing member, said bracket having longitudinal opening therethrough and a pair of projecting outwardly tapered end portions adapted to engage said pair of elongated caps;

first means disposed through said elongated caps and the longitudinal opening of said bracket engaging said spacing member;

second means adapted to be disposed through a concrete form sheet for engaging said spacing member;

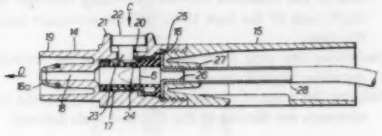
first means adapted to engage adjacent sheets of insulating material and coupled to said first means for engaging for tensioning said spacing member; and

second means adapted to abut on a concrete form sheet and coupled to said second means for engaging and for tensioning said spacing member.

4,426,062
FLUID FLOW CONTROL VALVES

Howard J. Bowron, Maidenhead, England, assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 10, 1982, Ser. No. 347,556
Int. Cl.³ F16L *55/14*
U.S. Cl. 251—7 **12 Claims**

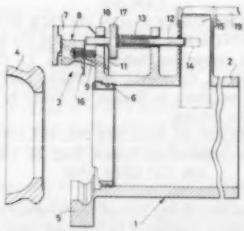


1. A control valve, comprising:
a resilient tube;
a duckbill valve mounted within the tube and operable to an open position by an external pressure applied to the tube in the vicinity of the valve to distort the tube and thereby open the valve;
the resilient tube being located within a rigid sleeve apertured to permit the application to the tube of the external pressure;
the tube having locating means, mating locating means being provided on the sleeve for co-operation with the locating means on the tube to orientate the tube within the sleeve;
an operating member for applying the external pressure to the tube, the operating member having a stem portion;
the sleeve having a pocket adapted to receive said stem portion and to locate said stem portion in a position in which pressure applied to the tube by said operating member opens the valve;
said tube having a flange at each end engaging a respective end of said sleeve whereby said sleeve is retained in axial position between the flanges; and
a housing with a through bore adapted to accommodate the sleeve, the housing having an aperture positioned adjacent to the pocket in the sleeve, the operating member extending through the aperture.

4,426,063
TERMINAL PIPE FITTING PROVIDED WITH A SELF-LOCKING DEVICE FOR THE RELEASABLE COUPLING TO A FLANGED MOUTH, PARTICULARY FOR THE LOADING OF A FLUID OIL PRODUCT INTO A LORRY TANK

Giorgio Bormioli, Via Galileo Galilei, 11, 35100 Padova, Italy

Filed Nov. 4, 1981, Ser. No. 318,032
Claims priority, application Italy, Dec. 23, 1980, 26895 A/80
Int. Cl.³ F16L *37/28*
U.S. Cl. 251—149.9 **3 Claims**

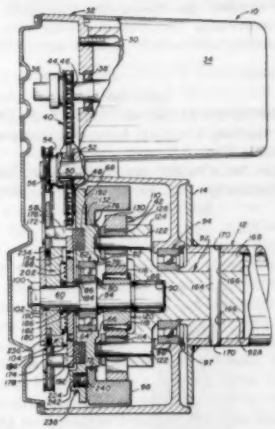


1. Terminal pipe fitting, comprising a tubular body open at its ends, a check-valve located in said tubular body and provided with a drive shaft protruding therefrom, and a device for coupling the flanged mouth of a nozzle to one end of said tubular body, characterized in that said device comprises at least one movable seat on said body engagable with a first flange portion of said mouth, first resilient means urging said movable seat elastically towards a rest position in which it is axially and radially spaced from said one end of the pipe fitting, said seat having thereon a radial appendix engageable by the front side of said mouth during relative movement of said tubular body and pipe fitting one toward the other, thereby to effect the displacement of said movable seat along an oblique path towards a latching position in which said movable seat is engaged against said first flange portion of the mouth to keep the latter in close, sealing contact with said one end of said tubular body, a movable member on said body displaceable to a first position in which a part thereof is partially inserted in a radial cavity in said drive shaft of the check valve to lock the latter in closed position, and second resilient means elastically urging said member towards a second position in which said part of the movable member is completely outside said cavity to allow the displacement of the check-valve to its open position, said member and said movable seat cooperating with one another, so that, with said movable seat in its rest position, said member is kept by said movable seat in said first position and, with said movable seat in its latching position, said member is left free to be moved by said second resilient means to said second position, in which it keeps, in its turn, said movable seat in said latching position until said member is returned to its first position.

4,426,064
WINCH DRIVE MECHANISM

James W. Healy, Wakefield, Mass., assignor to Superwinch, Inc., Putnam, Conn.

Filed Mar. 25, 1981, Ser. No. 247,288
Int. Cl.³ B66D *1/14, 1/20, 1/22, 3/16*
U.S. Cl. 254—342 **8 Claims**



5. A winch drive mechanism comprising a housing, a cable drum rotatably supported on the housing, a selectively reversible, powered input drive shaft rotatably supported on the housing coaxially with the cable drum and having a eccentric fixed to the drive shaft, a single stage speed change reducer connecting the drive shaft and cable drum including a ring gear supported for rotation relative to the housing in coaxial relation to the drive shaft and a cycloid gear in meshing engagement with the ring gear, the cycloid gear being supported on the drive shaft eccentric for eccentric movement thereon within the ring gear for rotating the cable drum responsive to rotation of the drive shaft, and a removable clutch pin for releasably interlocking the ring gear and housing in fixed relation, the ring gear including a plurality of peripheral lobes

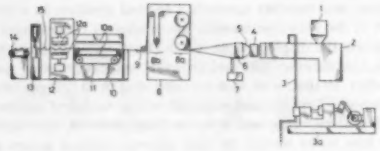
extending radially outwardly for engagement with the clutch pin.

4,426,065

CONTINUOUS PROCESS FOR THE PRODUCTION OF POLYSTYRENE FOAMED ARTICLES

Nobuyuki Komatsuzaki; Masahiro Tsubone, and Bon Machida, all of Koga, Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Dec. 15, 1981, Ser. No. 330,823
Claims priority, application Japan, Dec. 27, 1980, 55-186618
Int. Cl.³ B29D 27/00
U.S. Cl. 264—45.9 12 Claims



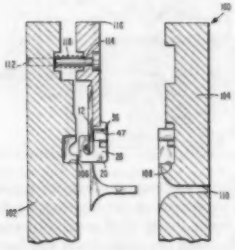
1. A process for continuouly producing shaped articles of polystyrene foam characterized by extruding a polystyrene resin composition which contains 0 to 20% by weight of a rubber as a blend or copolymer component based on the polystyrene resin from the die of an extruder along with a blowing agent to prepare a foamed material, cooling the foamed sheet material to a surface temperature at least not higher than a softening point of the polystyrene resin while stretching the material uniaxially or biaxially to obtain a sheet of polystyrene foam having a bulk density of 0.15 to 0.7 g/cm³, a thickness of 0.3 to 1.0 mm, 5 to 20 cell membranes widthwise of the sheet and a draw ratio of up to 1.25 and containing 0.03 to 0.3 mole/kg of the residual gas of the blowing agent, and subsequently thermoforming the resulting sheet into the desired shape with heating substantially without aging the sheet.

4,426,066

METHOD OF MAKING SLIDE FASTENER

Norman W. MacFee, Conneaut Lake, Pa., assignor to Talon, Inc., Meadville, Pa.

Division of Ser. No. 674,008, Apr. 5, 1976, Pat. No. 4,078,278.
This application Dec. 16, 1977, Ser. No. 861,384
Int. Cl.³ B29D 5/00
U.S. Cl. 264—252 1 Claim



1. A method of making an invisible-type slide fastener comprising the steps of

providing a mounting tape with an open mesh area near the edge thereof,

positioning the mounting tape between a stationary mold form having a molding cavity formed therein and a core member resiliently biased away from the stationary mold form,

moving a movable mold form having a molding cavity formed therein against the stationary mold form, the movement of the movable mold form pressing the core member against the stationary mold with the mounting tape being held therebetween,

injecting molten thermoplastic material into the cooperating molding cavities between the mold forms so that the slide fastener elements are formed therein with fastening extension of the elements formed extending through the open mesh area of the tape to secure the elements securely to the tape,

removing the tape from the mold forms by retracting the movable mold form, and

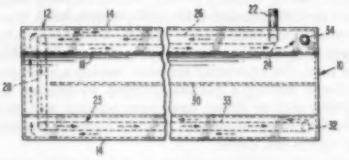
folding the edge of the mounting tape so that the coupling elements are hidden in the finished slide fastener.

4,426,067

METALLIC SECTIONAL LIQUID-COOLED RUNNERS

Robert W. Hopkins, Boca Raton, Fla., assignor to The Calumite Company, Trenton, N.J.

Filed Jan. 7, 1983, Ser. No. 456,204
Int. Cl.³ C21B 7/14
U.S. Cl. 266—191 14 Claims



1. A runner for conducting a stream of molten slag from a blast furnace, comprising:

(a) a body hollowly formed to define therein a chamber through which water may be circulated as a cooling medium, the body having an exterior end-to-end channel providing a slag passage in heat-exchanging relation to the chamber; and

(b) a cooling tube having one end adapted for connection to a source of water under pressure, the tube extending along both sides of the channel in heat-exchanging relation thereto and having its other end opening into the chamber for circulation of the water first through the tube and thereafter through the chamber exteriorly of the tube, the chamber having an outlet port through which the water may be discharged after being so circulated.

4,426,068

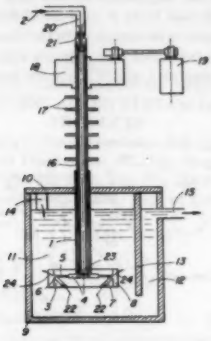
ROTARY GAS DISPERSION DEVICE FOR THE TREATMENT OF A BATH OF LIQUID METAL

Jacques Gimond, Grenoble; Richard Gonda, Le Grand Lemps; Jean-Marie Hicter, Coublevie, and Pierre Laty, Compiegne, all of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Jul. 26, 1982, Ser. No. 402,158
Claims priority, application France, Aug. 28, 1981, 81 16735
Int. Cl.³ C22B 9/00
U.S. Cl. 266—217 7 Claims

1. A rotary gas dispensing device for treatment of a bath of liquid metal which is contained in a vessel, said device comprising a hollow shaft, means for communicating the hollow shaft with a source of gas, a rotor of cylindrical shape mounted on the hollow shaft, a plurality of blades mounted on the periphery of the rotor and extending outwardly therefrom, a plurality of pairs of ducts defined by the rotor, each said pair comprising one duct communicating with the hollow shaft and

extending outwardly therefrom to said periphery, the other duct of each pair communicating with said bath at a location



inwardly of said periphery and extending to and intersecting said one duct of that pair.

4,426,069

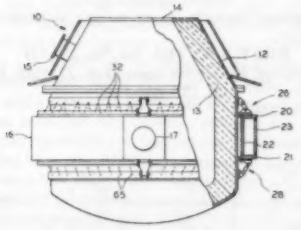
METTALURGICAL VESSEL SUSPENSION SYSTEM

Rashed N. Nagati, Mars, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 931,415, Aug. 7, 1978, abandoned. This application Sep. 13, 1982, Ser. No. 417,141

Int. Cl.³ C21C *5/50*

U.S. Cl. 266—246 **15 Claims**



1. A tiltable metallurgical vessel including:

a trunnion support at least partially surrounding said vessel and having upper and lower surfaces

first support engaging means abutting the upper surface of said trunnion support and being disconnected therefrom,

a first plurality of members disposed in spaced apart relation around said vessel and each being pivotally mounted at one end to said vessel and its other end to said first support engaging means,

said first support engaging means distributing the load from said first plurality of members to said trunnion support when said vessel is in an untilted position,

a second support engaging means abutting the lower surface of said trunnion support and being disconnected therefrom,

a second plurality of members spaced around said vessel and each being pivotally mounted at one end to said vessel and at their other ends to said second support engaging means,

said first and second support engaging means absorbing radial loading from said vessel.

13. A metallurgical vessel including:

a trunnion ring at least partially surrounding said vessel and having upper and lower surfaces,

said trunnion ring comprising a main ring and a secondary ring abutting said main ring and defining said lower surface,

a first plurality of pivot members each being disposed in spaced apart relation around said vessel and each being pivotally mounted at one end to said vessel at points spaced above said trunnion ring and its other end to means engaging said upper surface,

a second plurality of pivot members spaced around said vessel and each being pivotally mounted at one end to said vessel and at points spaced below said trunion ring at their other ends to said secondary ring,

said trunnion ring being tiltable to tilt said vessel about a generally horizontal axis, said first and second plurality of members being the sole support of said vessel in all tilted positions thereof.

4,426,070

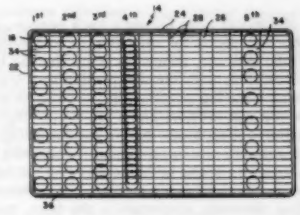
COIL SPRING ASSEMBLY WITH GRID AND BASE FRAME

Ronald Garceau, Southbridge, and Henry R. Ramsey, Dudley, both of Mass., assignors to Webster Spring Co., Inc., Oxford, Mass.

Filed Aug. 31, 1981, Ser. No. 297,772

Int. Cl.³ A47C *23/053*

U.S. Cl. 267—91 **8 Claims**



1. A spring assembly comprising, in combination, a rectangular grid and coil springs attached thereto, said rectangular grid comprising a border wire and longitudinally and transversely spaced wires attached at their ends to the border wire and at their crossings to each other and said coil springs having top and bottom loops with the top loops attached to the wires on the grid, said transversely spaced, longitudinally extending wires being arranged at a spacing which is less than half the diameter of the top loops of the coils, said longitudinally spaced, transversely extending wires being arranged in pairs with the spaces between pairs less than the diameters of the top loops of the coils and the spaces between the wires of pairs of wires greater than the diameters of the top loops of the coils, said transversely spaced, longitudinally extending wires underlying the pairs of transversely extending wires and being secured thereto at their crossings, the portions of the transversely spaced, longitudinally extending wires between each pair of transversely extending wires containing deviating and non-deviating portions, the deviating portions being displaced upwardly and being located equidistant from the transversely extending wires with a non-deviating portion therebetween, said top loops of the coils defining uninterrupted loops of greater diameter than the distance between any two transversely spaced wires at opposite sides of an intermediate longitudinally extending wire and of less diameter than the distance between the wires of any pair of transversely extending wires such that when the coil is mounted to a seat defined by three longitudinally extending, transversely spaced wires crossing a pair of transversely extending, longitudinally spaced wires, arcuate portions of the top loop will overlie the intermediate one of the longitudinally extending wires inwardly of the transversely extending wires and arcuate portions of the loop at right angles thereto will extend through the deviations of the

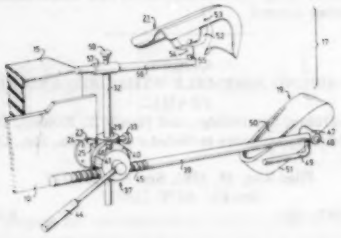
longitudinally extending wires beyond the longitudinally extending wires.

4,426,071

LEG SUPPORTING DEVICE FOR OBSTETRICAL TABLES

Sven M. Klevstad, Solna, Sweden, assignor to Landstingens Inkopscentral, Lic, Ekonomisk Forening, Solna, Sweden

Filed Feb. 9, 1982, Ser. No. 347,446
Claims priority, application Sweden, Feb. 13, 1981, 8101003
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—325 **1 Claim**



1. In an obstetrical table having a back portion, a seat portion, a leg portion, means for adjusting the back portion to any desired angular position, means for adjusting the leg portion from a position flush with the seat portion to a lowered position from which the leg portion may be inserted at least partially under the seat portion, and a leg-supporting device secured to the table at each side thereof and including a foot rest and a thigh support; the improvement comprising a bracket secured to each side of the table for carrying the leg-supporting devices, the bracket having a vertical bore therethrough, a guide bushing rotatably supported in the bore, means selectively to lock the guide bushing in any desired rotated position within the bore, a horizontal journal carried by the bushing, a head supported for rotation on the journal, means selectively to lock the head in any rotated position on the journal, the head having a bore therein substantially at right angles to the journal, a shaft disposed in the latter bore, means selectively to lock the shaft in any desired position of adjustment in the bore of the head, a foot rest mounted on the end of the shaft for swinging movement about an axis transverse to the shaft, means for selectively locking the foot rest in any adjusted position of rotation about the last-named axis, a vertical shaft carried for rotation by the bushing, means selectively to lock the vertical shaft in any rotated position relative to the bushing, a horizontal sleeve carried by the vertical shaft at its upper end, an arm slidable in the sleeve, means selectively to lock the arm in any slid position in the sleeve, the arm at its end having a holder, a thigh support carried by the holder, and means mounting the thigh support on the holder for swinging movement about an axis transverse to the arm.

4,426,072

GLUE APPLICATION SYSTEM FOR A COLLATING MACHINE

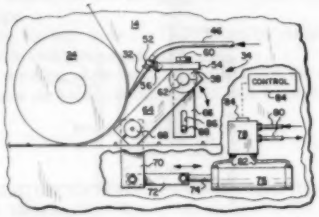
Robert C. Cole; Richard A. Gaspar, both of Centerville; Donald C. Stackhouse, Vandalia, and John L. Trentman, Tipp City, all of Ohio, assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 30, 1981, Ser. No. 259,120
Int. Cl.³ B42B *2/00*; B05C *3/02*
U.S. Cl. 270—53 **23 Claims**

1. For use in a collating apparatus of the type in which a plurality of rolls are mounted on spaced spindles and webs unwound therefrom are collected in overlapping relation, an improved glue application system comprising:

at least one nozzle having a flexible body, a tip at one end for contacting a supported surface of a selected web at a glue application point and an opposite end for mounting to a rigid support, said body extending at an angle other than normal to the supported surface and being sufficiently flexible that said body is capable of flexing between said ends in response to variations in the distance between said application point and said opposite end;

means mounting said nozzle body for biasing said one end



into contact at said glue application point so that said tip may remain in continuous contact with a supported web surface during operation of a collating apparatus;

a source of glue;

conduit means for conveying glue from said source to said nozzle; and

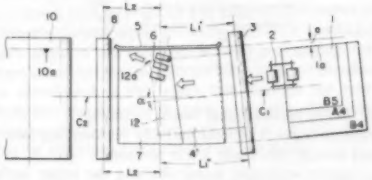
means for controlling flow of glue through said conduit means and said nozzle.

4,426,073

APPARATUS FOR ALIGNING A PAPER SHEET WITH A REFERENCE LINE

Kenichi Mizuma, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Feb. 12, 1981, Ser. No. 233,771
Claims priority, application Japan, Feb. 27, 1980, 55-22843
Int. Cl.³ B65H *9/16*
U.S. Cl. 271—251 **8 Claims**



1. Apparatus for aligning a paper sheet before transporting it to a desired position comprising:

feed means for feeding said paper sheet into said apparatus along a paper sheet travelling path;

reference wall means disposed at a predetermined position with the paper sheet travelling path defined in said apparatus for aligning one side edge of said paper sheet;

roller means for bringing said paper sheet translationally in contact with said reference wall means for alignment;

orientation adjustment means for adjusting the orientation of said paper sheet with respect to said reference wall means such that said paper sheet is moved with a leading edge corner of said side edge directed away from said reference wall means until said paper sheet comes into engagement with said roller means, wherein said roller means moves said paper sheet generally translationally toward said reference wall means such that the leading edge corner of said paper sheet closer to said reference wall means is

prevented from being first brought into engagement with said reference wall means; and

delivering means for delivering said thus aligned paper sheet to the desired position.

4,426,074

SWITCH FOR THE DIVERSION OF SPOILED ITEMS FROM AN OVERLAPPED STREAM OF PAPER PRODUCTS

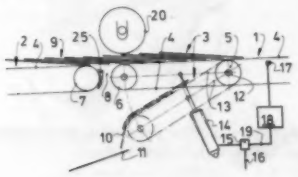
Emil Fischer, Ludwigshafen-Oggersheim, Fed. Rep. of Germany, assignor to Albert Frankenthal AG, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 284,610

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029154

Int. Cl.³ B65H *29/62*

U.S. Cl. 271—302 **8 Claims**



8. A conveyor system for signatures in a continuous overlapped stream having three conveyor belt flights, namely a first upstream conveyor belt flight, a third conveyor belt flight and a second conveyor belt flight placed therebetween for taking up signatures from a downstream end of the first conveyor belt flight and forwarding them to an upstream end of said third conveyor belt flight, an upstream roll and a downstream switch roll for supporting said middle conveyor belt flight, a control unit and a driving unit controlled thereby for moving said switch roll bodily and so changing its distance from an upstream end of said third conveyor belt flight, such bodily motion of said switch roll taking place in a part-circle about said second conveyor belt flight's upstream roll, and being between an upper switch roll position for forwarding all signatures coming onto said middle conveyor belt flight onto said third conveyor belt flight, and a lower switch roll position in which signatures are guided downwards between said second and third conveyor belt flights, a backer roll placed over said second roll so that said overlapped stream of signatures may be pushed against a lower face of said backer roll when said switch roll is in its said upper position, and a cover, covering an upstream end of said third conveyor belt flight where the belt of the same is run upwardly from a lower run to an upper run of said third flight.

4,426,075

EMERGENCY SHUT-OFF SWITCH FOR EXERCISE APPARATUS

Gary Otte, Brazil, Ind., assignor to Nissen Corporation, Cedar Rapids, Iowa

Filed Jun. 18, 1979, Ser. No. 49,618

Int. Cl.³ A63B *23/06*

U.S. Cl. 272—69 **11 Claims**

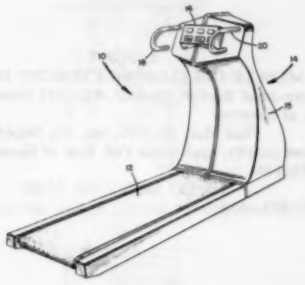
1. A safety switch assembly for use with a personal exercise machine of the type having a substantially horizontally arranged endless belt driven by an electric motor, and an upraised housing portion at the front of the machine, said assembly comprising:

handle means protruding from said upraised housing portion and being arranged to be grasped by the person using the machine;

switch means arranged internal to said machine and being electrically connected to disconnect said motor from a power source upon actuation of said switch means from an at-rest position;

linkage means connected between said handle means and said switch means and being located within said upraised housing portion,

biasing means, mechanically connected to said linkage means, for retaining said linkage means in a preselected position in which said switch means is in said at-rest position whereby said handle means is arranged with freedom



of movement allowing a short travel thereof and upon causing said handle means to undergo said short travel, said linkage means overcomes said biasing means and moves said linkage means from said preselected position so that said switch means moves from said at-rest position to an actuated position thereby disconnecting said motor from the power source, wherein said switch means includes biasing means for urging said switch means from its at-rest position to its actuated position when said handle means moves the predetermined amount.

4,426,076

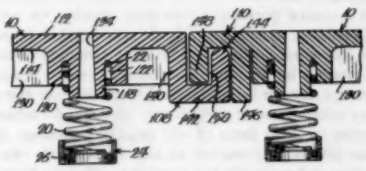
TUMBLING BOARD AND SPRING ASSEMBLY

Leonard Palmer, 1168 Westwood Trail, Addison, Ill. 60101

Continuation-in-part of Ser. No. 164,587, Jun. 30, 1980, Pat. No. 4,360,197. This application Dec. 22, 1980, Ser. No. 218,779

Int. Cl.³ A63B *5/00*; **E02F** *15/22*

U.S. Cl. 272—109 **5 Claims**



1. A tumbling surface construction comprising

a plurality of rectangular sheets in adjacency to each other, each having two opposed sides of a length that is a multiple of the length of the remaining two sides, an upper surface and a lower surface;

means interconnecting said sheets and comprising a plurality of stationary male and female interlocking devices about the periphery of each sheet in alternating fashion and disposed below said upper surface, said interlocking devices being generally upwardly and downwardly directed and of substantially equal length along the periphery of said sheets with the male interlocking devices on each sheet being interconnectingly received in female interlocking devices in adjacent sheets, there further being at least one male and one female interlocking device on each of said opposed sides, and

a plurality of spring assemblies secured to the lower surfaces of said sheets at spaced locations thereon,

whereby tumbling may be performed on said upper surfaces and be resiliently cushioned by said springs with the upwardly and downwardly directed male and female interlocking devices in alternating fashion preventing disassociation of adjacent sheets in side to side, end to end and up and down directions during the performance of a tumbling exercise.

4,426,077

MUSCLE DEVELOPING EXERCISE DEVICE

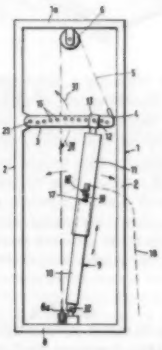
Hermann-Josef Becker, Hochstr. 52, 5521 Ferschweiler, Fed. Rep. of Germany

Filed Mar. 19, 1981, Ser. No. 245,468

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1980, 3011404

Int. Cl.³ A63B *21/04, 21/08*

U.S. Cl. 272—118 **15 Claims**



1. In a muscle-developing exercise device the improvement comprising the combination of a frame member, a lever arm member for being moved manually by a user and pivotally mounted on said frame member for swinging in opposite senses from a central position, a resistance member for applying a force tending to swing said lever arm member in one sense from its central position and resisting swinging of said lever arm member in the other sense from its central position, said resistance member being connectible to said lever arm member at any selected one of a plurality of locations for adjusting the effective resisting force of said resistance member, and stop means pivotally connected to and mounted on one of said members and swingable to a position to offset the force applied by said resistance member when said lever arm member is in its central position, the location of the connection of said resistance member to said lever arm member being adjustable while the force of said resistance member is offset by said stop means.

4,426,078

BOWLING ALLEY PITBOARD

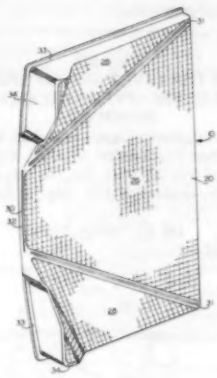
Julius L. Alonzo, Marshall Heights, Mechanicville, N.Y. 12110

Filed Dec. 11, 1980, Ser. No. 215,323

Int. Cl.³ A63D *5/02, 5/10*

U.S. Cl. 273—43 R **14 Claims**

1. A pitboard adapted to be installed in the pit of an automatic bowling machine, said board having a pin supporting and contacting surface made of hard and slippery material which is textured in smooth raised surfaces surrounded by depressed areas so as to permit bowling pins and balls to slide



and roll thereon while also permitting dirt particles and oil to accumulate between the raised surfaces.

4,426,079

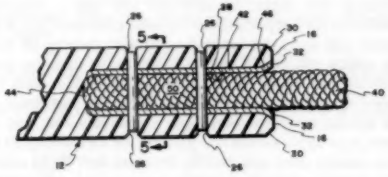
POLICE RESTRAINT DEVICE

James R. Mason, Box 2321, Idaho Falls, Id. 83401

Filed Mar. 19, 1982, Ser. No. 360,110

Int. Cl.³ F41B *15/02*

U.S. Cl. 273—84 R **5 Claims**



1. A restraint device for use in law enforcement and the like comprising:

a pair of spaced elongated handles to be held by and manipulated manually by the user, each handle having a major axis and an axially disposed blind bore in the proximal end thereof and a substantial body of handle material surrounding the blind bore;

a single length of cord of essentially non-elastic intertwined fiberous strands spanning between the spaced proximal ends of the handles;

each end of the cord being snugly encased within thin wall hollow metallic sleeve means, each sleeve means being non-rotatably and load transferringly connected to the cord end by a plurality of crimps in the sleeve means, the unstressed and unaltered transverse size of the sleeve means being substantially the same as the transverse size of the blind bore;

each sleeve means and encased and connected cord end being snugly disposed within the blind bore in the proximal end of the associated handle;

load transferring anchor means comprising a plurality of pin means disposed generally transverse of the axis of the associated handle, each pin means (a) passing through the intertwined fiberous strands of the encased cord end in shear load transferring relation and, (b) passing through aligned apertures in the wall of the sleeve means at a site other than the crimp sites in shear load transferring rela-

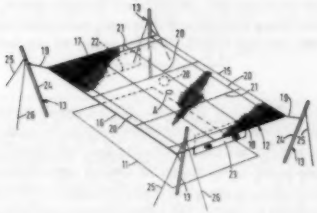
tionship, the ends of each pin means being respectively anchored in spaced aligned generally transverse bores in shear load transferring relation in the handle material surrounding the blind bore, each pin means receiving generally transverse bore in the handle material surrounding the blind bore having a length substantially greater than the wall thickness of the sleeve means, whereby the cord ends are non-rotatably anchored to the respective handle to prevent separation under high stress utilization.

4,426,080

LIGHTER-THAN-AIR BALL GAME APPARATUS

Edward M. Stokes, Stillmeadow, Coniston, Nr. Hull, North Humberside HU11 411, England

Filed Jul. 8, 1981, Ser. No. 281,538
Int. Cl.³ A63B *67/00*
U.S. Cl. 273—118 A **7 Claims**



1. A games apparatus comprising, in combination:
(a) a lighter-than-air ball,
(b) a substantially planar roof which is such as to permit the ball to run along the underside thereof but not to pass therethrough, said roof being devoid of apertures sized to receive the ball,
(c) means for mounting the roof to lie above the ground to define thereunder a playing area having opposite end regions, said mounting means being arranged to maintain the roof at a height above the ground which is such as to permit players to move about on the playing area,
(d) means to enable a player to score over an adversary comprising goals to be engaged by the ball; the said goals comprising a single pair of goals respectively disposed in opposite end regions of the playing area and of a surface area substantially less than the area defined between the roof at the respective end of the playing area and the ground therebelow and of a lateral extent less than the lateral dimension of each said end region whereby a player needs to aim the ball to engage it with a goal.

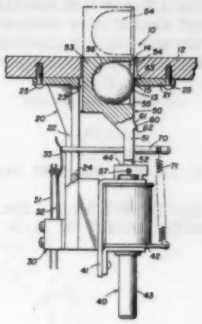
4,426,081

DROP TARGET APPARATUS

Zeilik Fainzilberg, Lincolnwood, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Aug. 25, 1982, Ser. No. 411,500
Int. Cl.³ A63F *7/00*
U.S. Cl. 273—127 D **10 Claims**

1. In a pinball game having a playfield board, a pinball that rolls on the board, and a drop target apparatus adapted to be struck by the rolling pinball and comprising a frame, a target member vertically movable with respect to said frame between a raised position projecting above the playfield board and a retracted position, said target member and said frame having interengaging latch means shiftable between a latched condition preventing vertical movement and a released position permitting vertical movement, and bias means urging said target member to its retracted position and simultaneously urging said latch means to the latched condition thereof, said target member including means defining a recess therein for receiving the pinball, said recess having an abutment for impingement by the pinball upon entering said recess to unlatch said latch means, whereupon said bias means draws said target



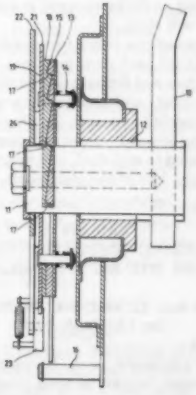
member and the pinball carried thereby into the retracted position.

4,426,082

IMPROVEMENTS TO POKER MACHINES-SIMULATED HANDLE ACTION

Joseph R. Heywood, 2 Beechwood Ave., Chorleywood, Herts, England WD3 5RL, and Leonard H. Ainsworth, 108 Dunning Ave., Roseberry, NSW, Australia

Filed Jun. 18, 1980, Ser. No. 160,818
Claims priority, application Australia, Jun. 25, 1979, PD9313
Int. Cl.³ A63F *5/04*
U.S. Cl. 273—143 R **3 Claims**



1. In an electrically operated poker machine mounted in a cabinet wherein the game cycle is initiated by the operation of an electric switch, a mechanism simulating the operation of a handle of a conventional mechanical poker machine comprising, a substantially conventional handle operable by a player and pivotably mounted on the cabinet, a friction clutch within the cabinet for increasingly resisting movement of the handle as it is moved through a predetermined actuating arc comprising an annular element fixed in relation to said cabinet and a movable annular element engaging said fixed element and arranged to move as said handle is moved, spring means resiliently retaining the engaging surfaces of said elements in contact with each other, a series of circumferentially extending interengaging ramps on the engaging surfaces of said elements arranged so that rotational movement of said movable element

causes the ramps on its surface to ride up the ramps on the surface of said fixed element thereby increasing frictional resistance to movement of said handle, the length of said ramps being such that ramps of the movable element reach the ends of ramps on said fixed element after the handle has moved through said predetermined actuating arc thereby suddenly decreasing said resistance, and means to operate said electric switch at the end of said actuating arc.

4,426,083

PUTTER

William C. Dishner, Jr., P.O. Box 1387, Marco Island, Fla. 33937

Filed Feb. 19, 1982, Ser. No. 350,202
Int. Cl.³ A63B *53/04, 53/14*
U.S. Cl. 273—164 **6 Claims**

1. A golf club of the putter type having a club head with at least one face symmetrical on either side of a vertical stem;

a bend in said stem above said face and in a plane parallel to said face;

a curved shoe flat on the bottom and in a plane transverse to the plane of said stem;

symmetrical truncations rising from said curved shoe and generally toward said stem in planes transverse to the plane of said face and forming two parallel lines on the top of said club head, said parallel lines spaced apart by a distance substantially equal to the diameter of a golf ball;

a shaft extending upwardly from said stem; and

a handle connected to said shaft, said handle having a length in excess of one-half of the club length.

4,426,084

TRUCKING SIMULATION GAME

Benjamin F. Michel, P.O. Box 309 Fordham Station, Bronx, N.Y. 10458

Filed Aug. 12, 1981, Ser. No. 292,254
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—254 **9 Claims**

1. A trucking simulation game for simulating a real-life trucking environment for two or more players, comprising:

(a) a truck-like playing piece for each player;

(b) a playing board having a predetermined travel path which is constituted of a plurality of playing spaces along which each truck-like playing piece is advanced during play;

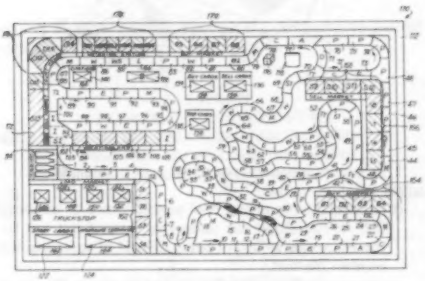
(c) truck load cards including a plurality of stacks of receipt cards for simulating different goods to be considered loaded on each truck-like playing piece, each receipt stack corresponding to a different goods and being stackable at a predetermined location on the playing board;

(d) load instruction cards including a stack of start cards for indicating to each player the quantities of each of the different goods to be considered loaded on the respective truck-like playing piece, said stack of start cards being stackable at a different predetermined location on the playing board, and indicating to each player who selects a card from the start stack of the quantities and prices of the different goods;

(e) simulated buy markets for simulating the buying by each player of a plurality of different goods to be considered loaded on the respective truck-like playing piece, each buy market being located at a different predetermined location of the playing board, each buy market composed of a plurality of buy areas each containing information of the prices of each of the goods to be bought;

(f) buy instruction cards including a stack of buy cards for indicating to each player, upon the arrival of his playing piece at a predetermined buying space of the travel path, of the quantities of each of the different goods to be bought, said stack of buy cards being stackable at a different predetermined location on the playing board, and indicating to each player who selects a buy card upon the arrival of a playing piece at the predetermined buying space of the quantities of each of the goods to be bought;

(g) simulated sell markets for simulating the selling by each player of a plurality of different bought goods, each sell market being located at a different predetermined location on the playing board, at least some of the sell markets



being composed of a plurality of sell areas each containing information of the prices of each of the goods to be sold;

(h) sell instruction cards including a stack of sell cards for indicating to each player, upon the arrival of his playing piece at a predetermined selling space of the travel path, of the quantities of each of the different bought goods to be sold, said stack of sell cards being stackable at a different predetermined location on the playing board, and indicating to each player who selects a sell card upon the arrival of a playing piece at the predetermined selling space of the quantities of each of the goods to be sold;

(i) said buy instruction cards, said buy markets, said sell instruction cards and said sell markets indicating respective different quantities and different prices for each of the goods to be bought and sold;

(j) random chance means for indicating to each player the number of playing spaces that each player must advance his respective playing piece along the travel path during his turn,

whereby the real-life trucking environment of loading, unloading, buying and selling different goods at different quantities and prices along a trucking route is simulated in a game situation.

4,426,085

AUTOMATIC RESETTING TARGET FOR FIREARMS

Lawrence Dixon, R.D. #3, Box 3902, Pottsville, Pa. 17901

Filed Jul. 6, 1982, Ser. No. 395,140
Int. Cl.³ F41J *7/04*
U.S. Cl. 273—392 **13 Claims**

1. An automatic resetting target device to be used with aerial projectiles comprising:

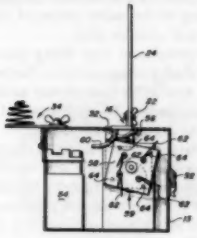
(a) a generally parallelepipedal housing having two side

walls, a back wall, a lid, a front wall, and a bottom, said lid including an aperture;

(b) a nutating target holder including a positioning arm mounted within said housing, said holder protruding through said aperture when said lid is closed;

(c) a rotating plate with tripping means in aligned position to engage said positioning arm during said plate's rotation;

(d) a motor linked to said rotating plate and operatively connected to a power source by wiring means; and,



(e) a normally open switch which is closed and activated only when said target holder is in its downward position;

whereby, when the impact of a projectile against a target causes said target holder to nutate from its upward to a downward position, said normally open switch is closed and said motor gyrates said rotary plate so that said tripping means engages said positioning arm causing said target to again be upright and said normally open switch to break the circuit.

4,426,086

ANNULAR SEAL AND METHOD OF USE

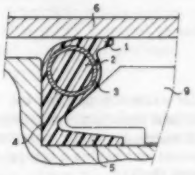
Rene Fournie, Pau; Francois Besnard, Lescar; Jacques Hons-Olivier, Paris, and Alexandre Pierre, La Garenne Colombes, all of France, assignors to Societe Nationale Elf Aquitaine (Prod.), Courbevoie, France

Filed Aug. 19, 1982, Ser. No. 409,636

Claims priority, application France, Sep. 3, 1981, 81 16739

Int. Cl.³ F16J *15/12, 15/32*

U.S. Cl. 277—1 **11 Claims**



6. A method for installation of the annular seal means as stated in claim 1 characterized by the steps of:

introducing said seal means in said annular space between said shaft and said tube for which seal tightness is required at high pressures,

fixing the base plate of said seal means to said shaft, said shaft having an annular shoulder designed to serve as a bearing face for the main annular body portion of the seal in an actuated sealing position,

producing an axial thrust against said annular body portion by a mobile actuator part to circumferentially extend the spring and to cause straightening and bearing of the annular body portion against said shoulder and applying said lip with force against the sidewall of the tube under the effect of said thrust.

4,426,087

NON-CONTACTING GAS SEAL FOR RELATIVELY ROTATING PARTS

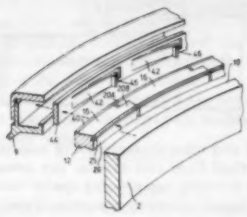
Raymond F. Sargent, and Paul Newman, both of Bristol, England, assignors to Rolls-Royce Limited, London, England

Filed Jan. 20, 1982, Ser. No. 341,012

Claims priority, application United Kingdom, Jan. 31, 1981, 8103024

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—3 **8 Claims**



1. A non-contacting seal for reducing fluid flow between relatively rotatable components of a machine comprises a seal ring having a sealing face, the seal ring being adapted to be disposed, in operation, on one of the components with its sealing face confronting a cooperating sealing face on the other component to form a seal therebetween, means for locating the seal ring in a housing with freedom of movement in a direction normal to said sealing faces, the seal ring being formed in a plurality of segments, each having a face which includes a sealing area and a lifting area, said sealing area forming part of the sealing face of the ring, and further means for providing a seal between the ring and the housing, characterised in that:

the lifting area of each segment extends substantially from a leading end to a trailing end thereof,

the leading end of each segment being arranged to overlap the trailing end of an adjacent segment in such a manner as to provide a step between the ends of the adjacent segments whereby, in use, a tapering gap which converges towards the trailing end of each segment is produced between at least the lifting area of each segment face and the confronting sealing face of said other component, said tapering gap for generating lift to maintain non-contact between at least the lifting area of each segment face and the confronting sealing face of said other component, and,

means for maintaining the relative circumferential positions of the segments while allowing radial movements of the segments relative thereto.

4,426,088

CENTRIFUGAL FLUID SEAL WITH DRAIN HOLES AND FLUID DIVERTING MEANS

Hermann H. F. Ernst, R.R. 2, St. Cloud, Minn. 56301

Filed Jul. 26, 1982, Ser. No. 401,737

Int. Cl.³ F16J *15/42, 15/44*

U.S. Cl. 277—14 R **18 Claims**

1. A centrifugal fluid seal for a shaft mounted for relative rotation with respect to a housing, said seal comprising:

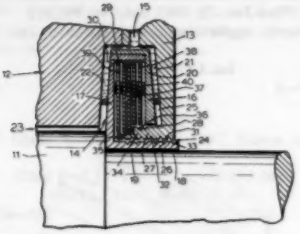
(a) a hollow rotor having an axial opening receptive of the shaft in fluid-tight relation, said rotor having a number of drain holes extending therethrough near the largest diameter of its hollow interior;

(b) a housing having means defining a cavity surrounding said rotor in spaced relation to said rotor and the shaft, thereby defining a space, receptive of a sealing fluid or fluid leakage, between said housing and the radially outer portion of said rotor into which space said drain holes open;

(c) said housing and said rotor jointly defining an annular

gap leading from said space to the interior of said rotor radially inwardly of said drain holes; and

(d) means carried by said housing and disposed within the



interior of said rotor downstream of said annular gap for diverting fluid from said annular gap toward said drain holes, said diverting means being spaced radially inwardly from any liquid collecting upstream of said drain holes.

4,426,089

DUST-PROOF DEVICE FOR MECHANICAL SEAL

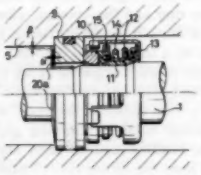
Akira Takenaka, and Tatsuhiko Fukuoka, both of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan

Continuation of Ser. No. 92,163, Nov. 7, 1979, abandoned. This application Jun. 9, 1982, Ser. No. 386,817

Claims priority, application Japan, Nov. 8, 1978, 53/153654[U]

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—27 **9 Claims**



1. In a mechanical seal including a seating ring which receives therethrough a rotary shaft and forms a stationary member and a follower ring which is rotated together with said rotary shaft in sliding contact with said seating ring, said seating ring having a substantially radially extending end face facing axially away from said follower ring and a sliding surface in said sliding contact with said follower ring, said seating ring being supported in a shaft passage in a casing, and an annular member attached at its central opening to and extending in a direction outwardly from said rotary shaft oppositely to the end face of said seating ring, the improvement being comprised by:

said annular member comprising means for avoiding entry of dust from outside air into the area of sliding contact between said rings, both during rotation and absent rotation, said means being an annular dustproof disk consisting of an axial sleevelike part fixed on said shaft and an annular radial platelike part fixed at its inner edge to said axial part,

said axial sleevelike part being loosely surrounded for most of its axial length by said stationary seating ring with one end thereof extending axially just beyond said end face of said seating ring to support said radial platelike part, said disk being flexible and of substantially constant thickness and L-shaped cross-section, said platelike part being of bend-free, substantially linear cross-section extending outward substantially radially from said axial part to a substantially radially outward facing free outer peripheral edge engageable with said seating ring end face in the nonrotating condition of said shaft to impede dirt inflow to said sliding contact area,

the axial extent of said outer peripheral edge corresponding to the material thickness of said platelike part,

said platelike part having axially oppositely facing inner and outer annular side surfaces, said annular inner side surface being smooth and spaced from said seating ring end face across an axial clearance space, during rotation of the shaft, of small thickness impeding dirt inflow to the sliding contact area but not gas outflow therefrom and of length corresponding to the radial extent of overlap of said seating ring by said annular disk,

said free outer peripheral edge being spaced from the inside wall of said shaft passage across a further clearance space of thickness similar to that of said axial clearance and of length corresponding to said material thickness of said platelike part,

said further clearance space being at the radially outer edge of said axial clearance space and forming a continuation thereof, said annular disk thereby forming during rotation a substantially L-cross-section clearance extending radially outward along said seating ring end face and then bending axially away from said end face,

means sealing said follower ring to said shaft and, cooperatively therewith and with said seating ring, forming a small closed annular cavity substantially sealed to outside gas except for communication with the radially inner end of said clearance space.

4,426,090

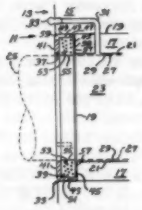
PRESSURE RELIEF EXCLUSION SEAL

Michael J. Bender, Aurora, Ill., assignor to Halogen Insulator & Seal Corp., Elk Grove, Ill.

Filed Sep. 24, 1982, Ser. No. 422,577

Int. Cl.³ F16J *15/16, 15/48*

U.S. Cl. 277—27 **18 Claims**



1. An annular exclusion seal for use with a bearing and a bearing mount, said exclusion seal comprising:

an annular housing for being removeably mounted in the bearing mount and having a central opening for receiving a cylindrical shaft,

an annular ring wall on said housing,

at least one radially extending side wall joined to said ring wall and defining therewith an annular chamber,

resilient sealing means including a sealing ring in said annular chamber having a sealing surface for sealing engagement with a sealing surface on another member with the sealing surfaces having a relative rotational sliding surface contact with each other to prevent grease from flowing past the sealing surface,

means on said annular housing defining an outlet orifice extending into said ring wall to permit grease to flow from the housing,

said resilient sealing means being movable from a sealing position blocking flow of grease through said orifice to a relief position allowing grease to flow past said sealing ring and through said orifice, said resilient sealing means returning said sealing ring to said sealing position when

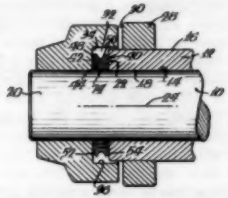
the grease pressure has been reduced below a predetermined pressure.

4,426,091

TRACK JOINT SEAL ASSEMBLY WITH INTERLOCKED THRUST RING

John M. Baylor, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed May 10, 1982, Ser. No. 376,755
Int. Cl.³ F16J *15/38, 15/32*
U.S. Cl. 277—83 **8 Claims**



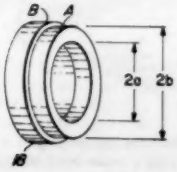
1. In a seal assembly including first and second axially spaced members mounted for relative rotation about a common axis, the first member having a counterbore formed in one face so as to define a first annular surface, the second member having a second annular surface, said first and second annular surfaces being spaced apart and faced toward each other on respective planes transverse to the common axis of rotation, an improved seal arrangement positioned between and in abutting contact with said first and second annular surfaces, comprising: a seal ring of elastomer material positioned in said counterbore between and in abutting contact with said first and second annular surfaces, said seal ring having an annular body portion and two radially outwardly extending leg portions having a radial extent less than that of said first and second annular surfaces, said leg portions having circular edges at the axially opposite ends of said seal ring which are in respective compressed contact with said first and second annular surfaces for sealing therewith; and a thrust ring of rigid material formed within said body portion of said seal ring, said thrust ring having a radial extent less than the radial extent of said body portion of said seal ring, said thrust ring having a plurality of circumferentially spaced axial recess portions formed in an inner surface thereof such that the elastomer material of said seal ring extends into and fills said axial recess portions.

4,426,092

MECHANICAL SEAL ASSEMBLY

Winfred J. Wiese, Whittier, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 314,302, Oct. 23, 1981, abandoned. This application Jun. 30, 1982, Ser. No. 393,580
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—96.1 **2 Claims**



1. A mechanical seal assembly for sealing a rotary shaft to a housing having a shaft opening through which the shaft extends, comprising:

a rotatable seal ring encircling and connected to said shaft for rotation therewith and for limited axial movement relative to said shaft;

a stationary seal ring encircling said shaft and connected to said housing;

said rotatable and stationary seal rings having opposed and generally radial sealing surfaces; and

means for urging one seal ring toward another;

said rotatable seal ring being of stepped configuration and consisting of two unitary ring portions, each ring portion having the same axial dimension, one ring portion having inner and outer diameters greater than the inner and outer diameters of the other ring portion;

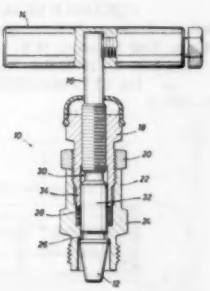
the diameters of the ring portions being selected to provide a desired degree of deflection of the sealing surface of said rotatable seal ring.

4,426,093

STEM PACKING WITH SLITTED FLEXIBLE POLYMER SLEEVE

Walter T. Roush, 5606 Valerie St., Houston, Tex. 77081

Filed Jan. 20, 1983, Ser. No. 459,337
Int. Cl.³ F16J *15/20;* **F16K** *41/04*
U.S. Cl. 277—110 **5 Claims**



1. A stem seal assembly to be placed around a stem in a valve having a bonnet with a cavity for receiving a stem seal therein in surrounding relationship to a stem passing through said bonnet, and a bushing having a protruding lower skirt adapted to contact the stem seal in the cavity to radially expand for sealing, the stem seal comprising an elongate hollow cylindrical tubular body having an outer face and an inner face, and which stem seal is formed of an elastomeric material having sealing characteristics at surface in contact with the bonnet and stem, said stem seal further incorporating a plurality of parallel cuts from the outer face toward the inner face to a specified depth further defining a thin wall at the end of the cuts adjacent to the inner wall of the cylindrical body, and wherein this thin wall has a thickness of about 0.005 inches or greater.

4,426,094

NON-METALLIC GUARD FOR SEALING LIPS

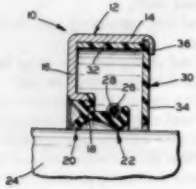
Joseph Antonini, Chicago, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed Jan. 20, 1983, Ser. No. 459,423
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—153 **11 Claims**

1. In an oil seal assembly comprising a structural metallic outer casing, an inner casing contained within said outer casing, said outer casing including a radially inwardly extending portion having a sealing element bonded thereto, said inner casing including a radially inwardly extending portion juxtapo-

sitioned with said sealing element for protection of said element; an improvement comprising said inner casing:

(a) formed of a non-metallic, resilient material, and



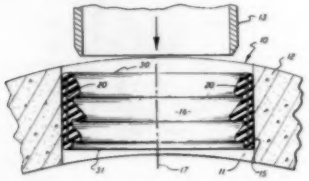
(b) supported axially within said outer casing by non-bonded, mechanical means.

4,426,095

FLEXIBLE SEAL

Robert C. Buttner, Syracuse, N.Y., assignor to Concrete Pipe & Products Corp., East Syracuse, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,078
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—207 A **5 Claims**



1. A composite flexible seal for providing a leak-proof joint within an annular space between the outer surface of a cylindrical pipe and the continuous unbroken surface of a circular opening passing axially into a pipe receiving member through one wall thereof, said seal including

an annular body section fully contained within said opening that is formed of an elastomeric material, said body section having an outer surface having a diameter that is slightly greater than the diameter of the circular opening passing into said pipe receiving member and an inner surface having a diameter that is greater than the outside diameter of said pipe,

a cylindrical ring encapsulated within the said body section that has an outside diameter that is less than the diameter of the opening in the pipe receiving member, said ring being formed of a spring-like material which permits the body section to be collapsed inwardly so that the body can be inserted axially into said circular opening and then snapped back into a circular condition to deform the body section into locking contact around the entire wall periphery of the opening to secure the body therein, and

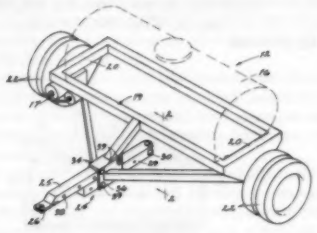
at least one circular deflectable fin depending inwardly from the body in a radial direction to encircle in sealing contact the outside surface of a pipe that is passed into the seal to form a leak-proof joint between the pipe and the receiving member.

4,426,096

BRIDGE CART

John G. Rodrigues, Jr., Rte. 1, Box 121; Gale F. Rettkowski, Rte. 1, Box 119, and William H. Jessup, Rte. 1, all of Wilbur, Wash. 99185

Filed Apr. 22, 1982, Ser. No. 370,726
Int. Cl.³ B62D *53/04*
U.S. Cl. 280—411 C **13 Claims**



1. A cart mountable between a tractor and the tongue of an agricultural implement, comprising:

a wheel supported frame;

a first elongated tongue member having a hitch member at one end for connection to the tractor, and a remaining end;

a second elongated tongue member having a hitch member at one end for connection to the implement tongue, and a remaining end;

bracket means on the frame mounting the tongue members with the hitch members extending longitudinally in opposite directions for individual longitudinal adjustment relative to the frame such that the longitudinal distance between the frame and one of the hitch members can be varied without altering the longitudinal distance between the frame and the remaining hitch member;

wherein the bracket means mounts the tongue members with the remaining ends thereof in an overlapping relationship and with one of the tongue members being situated elevationally above the other; and

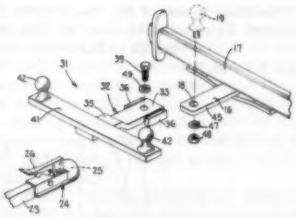
wherein the tongue members can be interchanged elevationally to adjust the effective height from the ground surface to the hitch members.

4,426,097

HITCH ADAPTER FOR SINGLE-WHEEL TRAINER

C. Glenn Livingston, 114 St. Andrews Ct., Columbia, S.C. 29210

Filed Feb. 16, 1982, Ser. No. 349,430
Int. Cl.³ B60D *1/06*
U.S. Cl. 280—415 A **2 Claims**



1. The combination comprising:

a vehicle having a trailer hitch mounted thereon, said trailer hitch including a hitch bar which is fixed to said vehicle and projects horizontally rearwardly thereof from below the rear vehicle bumper, said hitch bar having an opening

extending vertically therethrough in the vicinity of the free rearward end of the hitch bar, said opening normally permitting a conventional hitch ball to be mounted on the hitch bar;

a trailer having a single wheel mounted thereon for rollingly supporting same, said trailer having a tongue structure projecting forwardly thereof, said tongue structure mounting thereon in sidewardly spaced relationship a pair of conventional ball-receiving couplers; and

adapter means for coupling said trailer to said hitch bar for solely permitting relative vertical articulation between the trailer and the hitch bar about a substantially horizontal axis which extends perpendicular relative to the direction of vehicle movement;

said adapter means including a one-piece rigid frame which has a front portion adapted for rigid connection to said hitch bar and a rear portion adapted for connection to said trailer couplers, said frame being T-shaped when viewed from above and including a crossbar which defines said rear portion and a coupling bar which is fixed to said crossbar adjacent the center thereof and projects forwardly therefrom in substantially perpendicular relationship thereto, said coupling bar adjacent the front free end thereof defining said front portion, said front portion having a horizontal plate part with an opening extending vertically therethrough, said horizontal plate part and said hitch bar being disposed vertically one above the other in horizontally overlapping relationship so that the opening in the plate part is aligned with an opening in said hitch bar, and threaded fastener means projecting through said aligned openings for fixedly coupling said plate part and said hitch bar in said overlapping position;

said adapter means having a pair of conventional hitch balls fixedly mounted on and projecting upwardly from said crossbar adjacent the opposite ends thereof for engagement with said trailer couplers; and

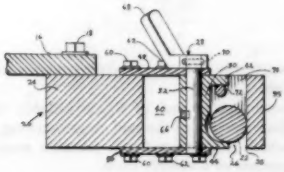
said front portion having a pair of side parts which are fixedly secured to the opposite sides of said horizontal plate part and project vertically therefrom to define a channel structure which opens vertically, said hitch bar being positioned within and closely confined by said channel-like structure so that said side parts are disposed directly adjacent the opposite side edges of the hitch bar when the latter is disposed in overlapping relationship with said horizontal plate part to prevent horizontal articulation between the frame and the hitch bar.

4,426,098

HEAD ASSEMBLY FOR A TOWING DEVICE

Samuel Kalmanson, 8320 SW. 23 St., Miami, Fla. 33155

Filed Feb. 5, 1982, Ser. No. 346,293
Int. Cl.³ B60D 1/00
U.S. Cl. 280—504 **6 Claims**



1. A head assembly of the type primarily designed for mounting on a towing device, said head assembly comprising:

(a) a body means having an operating chamber formed therein, recess means including a recess formed in said body means and extending across a portion thereof and into communicating relation with said operating chamber; said recess dimensioned to receive a a towing bracket therein;

(b) said body further comprising two side wall portions disposed in spaced apart relation to one another and in communicating relation to said recess; a bearing shaft mounted in interconnecting relation between said two side wall portions and in communication relation with said recess, whereby strength is added to said head assembly,

(c) cam means including a cam movably mounted within said operating chamber and rotatably positionable into and out of said recess in abutting relation with a towing bracket received therein, said cam including an exterior surface portion disposed and configured to at least partially captivate a towing bracket received within said recess;

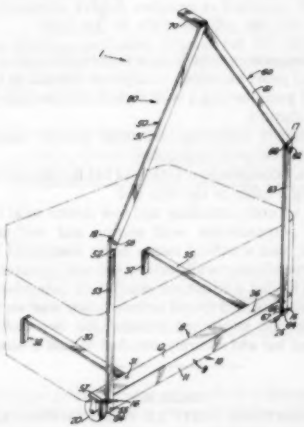
(d) said cam means further including a cam shaft journaled to said body for rotation relative thereto and fixedly secured to said cam for rotation therewith, whereby said cam is selectively rotatable into and out of locking relation to a towing bracket within said recess thereby connecting and disconnecting a towing device to the towing bracket.

4,426,099

COLLAPSIBLE LUGGAGE CARRIER

Sol A. Gross, 3154 Grand Ave., Baldwin, Long Island, N.Y. 11510

Filed Nov. 25, 1981, Ser. No. 324,876
Int. Cl.³ B62B 1/04
U.S. Cl. 280—655 **11 Claims**



1. A collapsible luggage carrier that folds into a compact linear configuration, said luggage carrier comprising:

(a) a rigid load support beam;

(b) a wheel assembly attached proximate each end of the support beam;

(c) a pair of independently folding spaced-apart load support forks, pivotally mounted to the support beam inward of and proximate to the wheel assemblies, the support forks when folded nesting adjacent to each other and against the support beam;

(d) means for locking each support fork in an unfolded position;

(e) a pair of independently folding frame struts, each comprised of an upper elongate member pivotally attached to a lower elongate member, the free ends of the upper elongate members terminating in handle portions juxtaposed to define a complete handle, the lower ends of the lower elongate members spaced-apart and pivotally mounted to the load support beam proximate to the wheel assemblies, the upper and lower elongate members of each folding frame strut pivoting approximately in the same plane as the upper and lower elongate members of the

other folding frame strut, so that when the folding frame struts are in a folded position:

the upper and lower elongate members of each folding frame strut nest adjacent to each other,

the nested elongate members of each folding frame strut nest adjacent to the nested elongate members of the other folding frame strut and

both folding frame struts nest against the support beam with the handle portions overlaying the ends of the support beam; and

(f) means for locking each folding frame strut in an unfolded position.

4,426,100

AUTOMOTIVE VEHICLE TOW DEVICE

Masao Yamabe, and Masaaki Uchiyama, both of Tokyo, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 3, 1980, Ser. No. 183,773

Int. Cl.³ B60D *1/04*

U.S. Cl. 280—770 **19 Claims**

1. In an automotive vehicle, a structure comprising:

a structural panel extending to adjacent the end of the vehicle, said panel having a wall section substantially perpendicular thereto;

a longitudinally extending structural member securely attached to said structural panel;

a tow device comprising a U-shaped bar having two ends for receiving a cable or the like; and

means for securely attaching said tow device to at least one of said perpendicular wall section and said structural member, said attaching means being interposed between said perpendicular wall section and said structural member and having a structural attachment comprising:

a flat section attached to said perpendicular wall section; and

a raised section interposed between the two ends of said U-shaped bar and securely attached to said U-shaped bar.

4,426,101

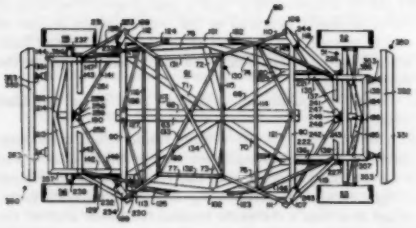
AUTOMOTIVE VEHICLE WITH IMPROVED SUSPENSION SYSTEM

Curtis A. Dyer, 2297 W. Steel La., Santa Rosa, Calif. 95401

Filed Sep. 21, 1981, Ser. No. 304,069

Int. Cl.³ B62D *9/02*

U.S. Cl. 280—772 **24 Claims**



1. An automotive vehicle having a longitudinal axis and including in combination:

a stationary rigid front axle assembly having wheels mounted at each end for rotation and steering means for turning said wheels,

a stationary rigid rear axle assembly having wheels mounted at each end for rotation,

a rigid frame enclosing and protecting a passenger compartment in between said front and rear axle assemblies and having forward and rear transverse members respectively near each end of said frame,

a pair of widely spaced-apart, substantially parallel, forward struts on opposite sides of and parallel to said longitudinal axis and extending between a said forward transverse member and said front axle, connected to each of them by a universal joint at each end of said forward strut,

a pair of widely spaced-apart, substantially parallel, rearward struts on opposite sides of and parallel to said longitudinal axis and extending between a said rear transverse member and said rear axle and connected to them by a universal joint at each end of said rearward strut,

a pair of converging front struts connecting a said forward transverse member to said front axle by a universal joint at each end of each said front strut, said front struts being wide apart at one end and close to each other at the other end,

a pair of converging rear struts connecting a said rear transverse member to said rear axle by a universal joint at each end of each said rear strut, said rear struts being wide apart at one end and close to each other at the other end, and

vertically mounted spring and shock absorbing means between and bearing against said frame and each said axle on each side of said longitudinal axis.

4,426,102

AUTOMATICALLY FASTENING SEATBELT SYSTEM

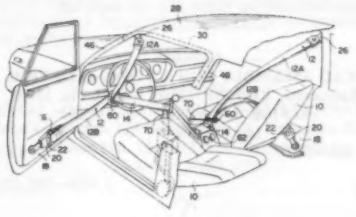
Mitsuaki Katsuno, and Shigeru Moriya, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 30, 1981, Ser. No. 325,926

Claims priority, application Japan, Dec. 1, 1980, 55-172374[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **3 Claims**



1. An automatically fastening seatbelt system comprising:

an outer webbing;

an inner webbing one end of which slidably engages an intermediate portion of the said outer webbing, the other end of which is connected to a retractor secured at the central portion of a vehicle floor;

a guide rail laid on a roof-side of a vehicle body for guiding a webbing anchor supporting said outer webbing in the longitudinal direction of the vehicle;

a perforated flexible tape guided by said guide rail and connected at one end thereof to said webbing anchor;

a sprocket wheel meshed with a portion of said flexible tape for driving said flexible tape along said guide rail;

a guide arm slidably engaging at the forward end thereof an intermediate portion of the inner webbing;

a gear train connected to a center shaft of said guide arm;

a motor for driving either one of said sprocket wheel or said gear train; and

a rotary shaft for connecting said sprocket wheel to said gear train so as to transmit a rotational force from one side to the other.

4,426,103

FLANGE JOINT

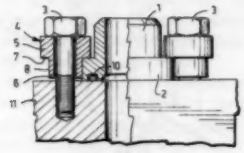
Göran Sundholm, Nahkelavägen, 04300 Hyrylä, Finland

Filed Mar. 10, 1981, Ser. No. 242,398

Claims priority, application Finland, Mar. 14, 1980, 800806

Int. Cl.³ F16L *25/00*

U.S. Cl. 285—12 **6 Claims**



1. A flange joint for coupling the end of a pipe, provided with a peripheral shoulder around the pipe end, to a connecting piece against which the pipe end abuts, comprising a plurality of individual separate, flange pieces, each of which is tightened by an individual attachment means to the connecting piece, each flange piece having two cylindrical sections of different diameters, a larger diameter and a smaller diameter joined at an abutting shoulder, and an axial through bore extending axially through the two cylindrical sections with the abutting shoulder of each flange piece axially abutting against the peripheral shoulder of the pipe end, and said axial bore being positioned eccentrically with respect to the smaller diameter cylindrical section and the entire smaller diameter cylindrical section lying outside of the boundries of said peipheral shoulder and pipe end thereby allowing a variety of peripheral shoulder sizes to be connected to said connecting piece.

4,426,104

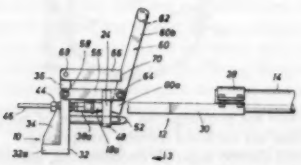
UNDERWATER CONNECTOR APPARATUS

Keith R. Hazelrigg, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Oct. 21, 1981, Ser. No. 313,282

Int. Cl.³ F16L *35/00, 55/00, 39/00, 37/00*

U.S. Cl. 285—26 **25 Claims**



1. Apparatus for making up underwater fluid connections comprising:

first and second connector assemblies, said second assembly having engagement formation means, and each of said assemblies comprising at least one conduit connector member, said connector members being matably connectable by movement of said assemblies toward each other in a first directional mode;

lever means carried by said first assembly and comprising a pair of lever members pivotable about a first axis transverse to said first directional mode of movement, said lever members being generally parallel and spaced apart along said first axis and having force transmitting arms engageable with said engagement formation means of said second assembly to urge said second assembly toward said first assembly in said first directional mode, and force receiving arms extending from said first axis generally in the opposite direction from said force transmitting arms, wherein said lever members have a terminal position with said force transmitting arms abutting said engagement formation means when said connector members are connected, and a releasing position with said force transmitting arms separated from said engagement formation means, said lever means further comprising means interconnecting said lever members for joint pivotal movement;

and lock means carried by said first assembly and having a locking position abutting at least one of said force receiving arms to prevent movement toward said releasing position for retaining said lever members in said terminal position.

4,426,105

JOINTS FOR PIPES, PARTICULARLY INTENDED FOR THE OIL INDUSTRY

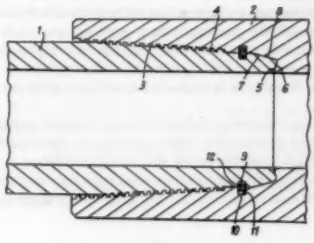
Bernard Plaquin; Paul Bounie, and Jean Mantelle, all of Aulnoye Aymeries, France, assignors to Vallourec, Paris, France

Filed Jul. 15, 1981, Ser. No. 283,722

Claims priority, application France, Jul. 17, 1980, 80 15829

Int. Cl.³ F16L *15/00, 35/00, 39/00, 25/00*

U.S. Cl. 285—92 **8 Claims**



1. In a pipe joint of the type in which a threaded end of a male member is screwed into a female member having a corresponding thread, the combination comprising a circumferential groove on the outer surface of said male member adjacent one end of its thread, a circumferential groove on the inner surface of said female member which, in the screwed position, faces said groove in said male member, a radially expansible and contractible spring ring simultaneously engaging in said grooves, at least one of said grooves having a sufficient radial depth to contain the entire radial thickness of the ring when the male member is being threaded into the female member, the simultaneous engagement of the ring in the groove of said male member and in the groove of said female member causing a substantial increase in the torque to be applied during the assembly or the disassembly of said joint.

4,426,106

PIPE COUPLING

James B. McCoy, 308 Winterbrook, Olathe, Kans. 66061

Filed Jul. 17, 1981, Ser. No. 284,210

Int. Cl.³ F16L *21/08*

U.S. Cl. 285—236 **5 Claims**

1. A pipe coupling arrangement for joining end portions of a pair of pipes, comprising:

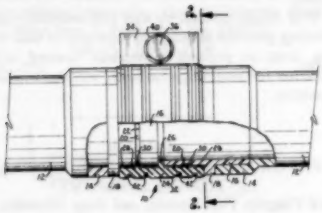
means providing a circumferential groove in the exterior

surface of the end portion of each pipe, each groove having a flat annular surface oriented generally perpendicular to the axis of the pipe and facing away from the end portion of the pipe;

a sleeve having open opposite ends for closely receiving the end portions of the respective pipes;

a plurality of circumferentially oriented striations on the inside surface of said sleeve engaging the pipe end portions inserted in the sleeve;

a pair of annular ribs on the inside surface of said sleeve located to fit in the respective circumferential grooves when the end portions of said pipes are fully inserted into the sleeve, each rib having a flat shoulder oriented perpendicular to the axis of the sleeve and engaged with said flat annular surface of the corresponding groove when the



pipe end portions are fully inserted into the sleeve thereby preventing axial withdrawal of the pipes from the sleeve;

a beveled surface on each rib opposite the shoulder thereof to facilitate application of said sleeve to the pipe end portions;

each rib having a shape when undeformed different from the shape of the corresponding groove and each rib being deformable to substantially fill the corresponding groove in a manner to seal against the adjacent groove surfaces when the sleeve is squeezed against the pipe end portions; and

means for clamping said sleeve onto the end portions of said pipes to squeeze the sleeve against the pipe end portions to maintain said ribs in the deformed condition in the corresponding grooves and to effect sealing engagement between said striations and the exterior surfaces of the pipes.

4,426,107

DOOR LOCKING MECHANISM

James F. Gibson, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Aug. 1, 1980, Ser. No. 174,499
Int. Cl.³ E05C *13/10*
U.S. Cl. 292—201 **5 Claims**

1. A locking mechanism for a door adapted to close an access opening in a structure comprising:

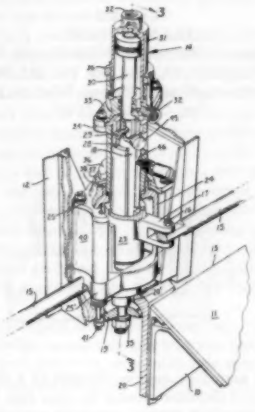
a bolt mounted on said door for reciprocation in a plane substantially parallel to the external surface of said door;

a lock element on one end of said bolt releasably engageable with a lock receptacle carried by said structure when said door is in the closed position;

at least one lug on a side of said bolt proximate its other end;

a lock sleeve mounted on said door for rotary movement to and from two extreme positions relative to said bolt, said lock sleeve surrounding said bolt adjacent said one bolt end and including a land sized to correspond with each said lug so as, in one extreme position, to vertically align with each said lug and thereby prevent reciprocation of said bolt whereby said lock element is engaged with said lock receptacle when said door is in the closed position and, in the other extreme position, to vertically desalign with each said lug and thereby allow reciprocation of said bolt whereby said lock element is disengaged with said lock receptacle when said door is in the closed position, said lock sleeve further including spherical mating surfaces to compensate for tolerance accumulations in both longitudinal and lateral directions;

an actuator operable on said lock sleeve to rotate it and each of its land into and out of the vertically aligned position aforesaid; and



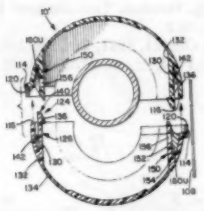
means for extending and retracting said bolt whereby said lock element and said lock receptacle are selectively disengaged and engaged when said means and said actuator are sequentially operated.

4,426,108

TAMPER INDICATOR

David A. Kesselman, 16685 Arnold Dr., Sonoma, Calif. 95476

Continuation of Ser. No. 274,483, Jun. 17, 1981, Pat. No. 4,372,593. This application Oct. 15, 1982, Ser. No. 434,550
The portion of the term of this patent subsequent to Feb. 8, 2000, has been disclaimed.
Int. Cl.³ B65D *55/02*; F16B *41/00*; H02G *15/10*
U.S. Cl. 292—307 B **9 Claims**



1. A seal for providing an indication of tampering with a connection nut enclosed thereby comprising:

first and second separate unconnected, interlockable collar portions for forming a collar for surrounding a connection nut,

each of said first and second collar portions including an outer wall having an inner and an outer surface,

first and second walls formed integrally with said outer wall and extending in substantially parallel spaced relationship therefrom, said first and second walls extending substantially normal to said outer wall and each terminating at an inner edge, the inner edges of the first and second walls of said first collar portion cooperating with the inner edges of the first and second walls respectively of said second collar portion to define enclosed openings in said collar

when said first and second collar portions are interlocked, said outer wall and first and second walls terminating at first and second spaced end edges, said first end edge being in a plane which is spaced outwardly beyond the plane of said second end edge, the first end edge of each of said first and second collar portions abutting the second end edge of the other collar portion when the first and second collar portions are interlocked,

a cuff located adjacent the second end edge and being formed integrally with said outer and first and second walls to extend completely around and outwardly of said second end edge, said cuff extending from said outer and first and second walls beyond said second end edge for a distance which is at least equal to the distance between the planes of said first and second end edges so that the cuff will extend over the abutting first and second end edges of said first and second collar portions when the first and second collar portions are interlocked,

and first and second spaced fastening means on each of said first and second collar portions with the first fastening means of each collar portion being adapted to engage and interlock with the second fastening means of the remaining collar portion at a location spaced inwardly from the first and second walls and the inner surface of the outer walls of said first and second collar portions to form said collar, said first fastening means including a first elongate member affixed at a base end thereof to the inner surface of said outer wall at a location spaced from but adjacent to said first end edge, said first elongate member having a free end opposite to said base end thereof which is spaced inwardly from the inner surface of said outer wall and which extends to and terminates at a terminal edge spaced outwardly beyond the plane of said first end edge, the free end of said first elongate member being provided with a first catch means on the portion thereof which extends outwardly beyond the plane of said first end edge, and said second fastening means including a second elongate member affixed at a base end thereof to the inner surface of said outer wall at a location spaced from but adjacent to said second end edge, said second elongate member having a free end opposite to said base end thereof which is spaced inwardly from the inner surface of said outer wall and which extends to and terminates at a terminal edge spaced outwardly beyond the plane of said second end edge but positioned within the confines of said cuff, the free end of said second elongate member being provided with a second catch means for engaging and interlocking with the first catch means of an adjoining collar portion when said first and second collar portions are interlocked, the free end of one of said first and second elongate members being spaced from the inner surface of said outer wall a greater distance than the free end of the remaining elongate member, said first and second elongate members and said first and second catch means being located and formed so that said first catch means of a first of said collar portions will engage the second catch means of a second said collar portions during but prior to the interlocking thereof to cause relative flexure between the free ends of said first and second elongate members, said first fastening means including a single reinforcing rib extending between the inner surface of said outer wall and said first elongate member, said single reinforcing rib being secured to said first elongate member substantially centrally thereof and being spaced substantially below said first end edge, said second fastening means including at least two spaced reinforcing ribs extending between the inner surface of said outer wall and said second elongate member.

4,426,109

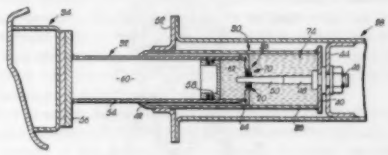
SHEAR TYPE PRESSURE RELIEF DEVICE FOR HYDRAULIC ENERGY ABSORPTION UNIT

Lester L. Fike, Jr., Blue Springs, Mo., assignor to Fike Metal Products Corporation, Blue Springs, Mo.

Continuation-in-part of Ser. No. 285,292, Jul. 20, 1981, abandoned. This application Aug. 25, 1981, Ser. No. 296,206

Int. Cl.[3] **A47C** *7/14;* **F16F** *1/00, 3/00*

U.S. Cl. 293—133 **23 Claims**



1. In a fluid system of the type including walls defining a fluid chamber, and structure presenting an opening through one of said walls for passage of fluid therethrough in the event of a rise in fluid pressure within the chamber above a predetermined level, the improvement which comprises:

an integral, frangible, centrally apertured, shear relief device separated from said one wall and located at least partially within said opening and including a flange portion surrounding the opening and in engagement with the surface of said one wall adjacent said opening, and a projecting portion extending into said opening, the zone of juncture between said flange portion and projecting portion including a sharp section;

rod means extending through said aperture of said device for restricting the flow of fluid through said aperture, said one wall carrying the device thereon being shiftable along the length of the rod means; and

said device being constructed and arranged in said one wall for expelling fluid through said opening upon experiencing a fluid pressure differential thereacross below a predetermined amount and for shearing at the region of said juncture with consequent expulsion of the sheared portion of the device through said opening, upon experiencing a fluid pressure differential thereacross above a predetermined amount.

4,426,110

CONTINUOUS ROTATION HYDRAULIC GRAPPLE

Johnny D. Mitchell, Gresham, and Hugh D. Armstrong, Sandy, both of Oreg., assignors to Mar Hook & Equipment, Inc., Sandy, Oreg.

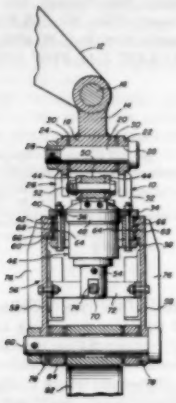
Filed Sep. 17, 1981, Ser. No. 303,112

Int. Cl.[3] **B66C** *13/14*

U.S. Cl. 294—88 **5 Claims**

1. A grapple assembly including an upper head connector for support from a crane boom, a depending head, journal means supporting said head from said head connector for reversible continuous rotation relative thereto about an upstanding axis, a rotator (motor) including an upper portion supported from said head connector and a lower rotatable portion supported from said upper portion for reversible continuous rotation relative thereto about an axis at least substantially coinciding with the first mentioned axis, connector means establishing a driving connection between said lower portion and a lower level portion of said head for rotary drive of the latter by said rotator independent of support of any appreciable downward loading of the weight of said head or a load supported therefrom on said rotator lower portion, grapple jaws means pivotally supported from said head for selective angular displacement relative thereto, reversible hydraulic motor means operatively connected between said head and said grapple jaw means for oscillating the latter relative to said head, said upper and lower portions of said rotator including

means defining relatively rotatable fluid coupling means including at least two ports on said upper rotator portion in constant fluid communication with a pair of fluid ports on said



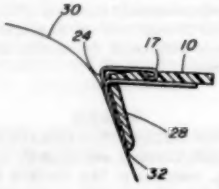
lower rotator portion throughout rotation of the lower rotator portion relative to the upper rotator portion, and means defining fluid pressure passages communicating said lower rotator fluid ports with said reversible motor means.

4,426,111

AUTOMOBILE RAIN SHIELD

Samuel C. Smith, 210 Hartman Rd., Newton Centre, Mass. 02159

Filed Oct. 29, 1981, Ser. No. 316,325
Int. Cl.³ B60J *1/08*
U.S. Cl. 296—95 R **6 Claims**



1. A removable snap-on shield assembly for preventing the entry of rain water into a vehicle interior through a partially open window of the vehicle, having a roof provided with a drip molding, wherein the shield assembly comprises:

a relatively narrow elongated strip of flexible material comprising, at spaced intervals along one long side, portions tapering to a narrow edge, and spaced interiorly from the tapered edge, an indentation in the surface of the flexible material;

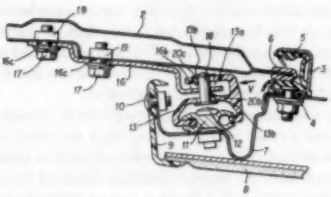
and clip means for detachably securing the strip to the drip molding of the roof above at least one window, wherein each clip comprises a sheet of spring material formed of one piece with an angularly disposed leg for forced friction into the drip molding of the vehicle and, spaced apart from and paralled to the main body of the clip, orthogonal to the friction leg, a displaced retaining leg formed from a partially cut out section of the main body of the clip wherein the outer end of the retaining leg is rolled over in the direction of the main leg of the clip, which rolled end fits within the shield indentation to secure the shield removably in place on the vehicle when the shield snaps onto the clips with a tapered edge of the shield aligned with each clip.

4,426,112

SLIDING ROOF FOR VEHICLES

Keiji Mori, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Oct. 5, 1981, Ser. No. 308,809
Claims priority, application Japan, Oct. 13, 1980, 55-145381[U]
Int. Cl.³ B60J *7/04*
U.S. Cl. 296—223 **7 Claims**



1. A sliding rood for vehicles, comprising:

a vehicle roof having an opening formed therein;

a sliding roof mounted on said vehicle roof for opening or closing said opening of said vehicle roof;

a rail member provided on opposite side portions of said opening of said vehicle roof, respectively;

a first and second shoe slidably engaged with each of said rail members, respectively;

drive cable means operatively connected to said first and second shoes; and

connecting plate means for operatively connecting each of said first and second shoes and said sliding roof so as to form a vertical and width directional clearance therebetween wherein said connecting plate means further comprises a connecting plate connected to said roof and a vertical pin interconnecting said connecting plate and each of said first and second shoes, said vertical pin being vertically slidably attached to said connecting plate and being movably supported in a width direction on said first and second shoes.

4,426,113

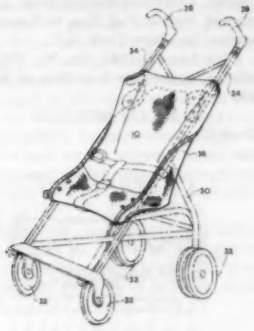
COVER FOR SEAT OF A COLLAPSIBLE STROLLER

Bernard R. Schutz, New York, N.Y., assignor to Fine Art Pillow & Specialties Corp., New York, N.Y.

Filed Aug. 27, 1981, Ser. No. 296,960
Int. Cl.³ A27C *27/00*
U.S. Cl. 297—219 **5 Claims**

1. A stroller comprising a frame having first and second generally parallel spaced members; a seat having a generally horizontal part and a generally upstanding part, said upstanding part being situated between said frame members, having a top, an interior surface, and an exterior surface, and comprising spaced side portions; and means for position-adjustably mounting each of said side portions to a different one of said frame members, and a cover for lining said seat, said cover having first and second sides and comprising first and second sections; each of said sections comprising first and second oppositely extending securing parts, said securing parts on each of said sides forming a pair and being spaced from each other, said first section being adapted to be situated adjacent said interior surface of said upstanding part, said second section being adapted to fold over said top of said upstanding part and be situated adjacent the exterior surface thereof, with said securing parts in each of said pairs being substantially aligned; and means for releasably interconnecting said securing parts in

each of said aligned pairs to form first and second closed loop structures, each of said structures being adapted to encircle a



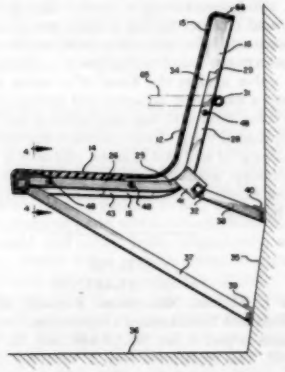
different one of said frame members, and at least a part of said side portion mounted thereto, to secure the cover to said stroller.

4,426,114

UNITARY SUPPORTING AND SEAT FRAME FOR RIGID SEAT

Norman J. Kehl, Elk Grove Village, and Richard C. Magnuson, Island Lake, both of Ill., assignors to Coach and Car Equipment Corporation, Elk Grove Village, Ill.

Filed Apr. 8, 1981, Ser. No. 252,057
Int. Cl.³ A47C 1/12, 7/02
U.S. Cl. 297—232 **14 Claims**



1. A multi-passenger, longitudinal, vehicle seat assembly comprising:

a plurality of separate, discrete seats composed of rigid material, arranged in a side-by-side relation and comprising means for seating at least three occupants;

each of said rigid seats comprising a substantially horizontally disposed seat portion integral with a substantially vertically disposed back portion having a seat top and a substantially continuous peripheral flange depending downwardly from the periphery of said seat portion and extending rearwardly from the periphery of said back portion;

said peripheral flange comprising a flange portion on each side of said seat;

a single, unitary supporting and seat frame for all of said seats;

said frame comprising a pair of end members each having a substantially horizontally disposed portion terminating at a front end and a substantially vertically disposed portion terminating at a top end;

a plurality of spaced-apart intermediate members located between said end members on said frame, each of said intermediate members having a substantially horizontally disposed portion terminating at a front end and a substantially vertically disposed portion terminating at a top end;

a horizontally disposed front frame member attached to the front ends of said end members and intermediate members;

a horizontally disposed upper frame member attached to the substantially vertically disposed portion of said end members and said intermediate members below the top ends of each and above said substantially horizontally disposed portion of each;

a horizontally disposed rear frame member attached to said end members and said intermediate members adjacent the bottom of the substantially vertically disposed portion of each;

said horizontally disposed upper frame member being located at about arm-rest height and substantially below said seat tops;

there being no horizontally disposed frame member above said upper frame member or between said upper frame member and said rear frame member;

means for mounting said unitary frame alongside a wall with said front, rear and upper frame members disposed substantially parallel to said wall;

and means for mounting said plurality of rigid seats directly on said unitary frame.

4,426,115

FOOT-REST ASSEMBLY FOR A FISHING CHAIR

Gaston Bissonnette, P.O. Box 2461, Freeport, The Bahamas

Filed Jul. 20, 1981, Ser. No. 284,732
Int. Cl.³ A47C 7/50
U.S. Cl. 297—423 **3 Claims**

1. A fishing chair in combination with a foot-rest assembly, said fishing chair comprising a base secured to or resting on a suporting surface and a seat swivelly mounted on said base for rotational movement about a vertical pivot axis, and which chair may include means to adjust the height and/or inclination of said seat relative to said supporting surface, said foot-rest assembly comprising:

(a) a pair of spaced legs;

(b) connecting means for removably and pivotally attaching one end portion of each leg to a respective side of said seat for pivotal movement of said leg about an axis transverse to said vertical pivot axis and parallel to the plane of said supporting surface;

(c) means to adjust said connecting means longitudinally of the respective legs;

(d) a bar-like foot-rest;

(e) fastening means securing the respective ends of said bar-like foot-rest to the other end of the respective legs, said foot-rest extending transversely of said legs;

(f) omnidirectional rollers mounted under the respective ends of said foot-rest and adapted to contact the support-

ing surface for supporting said foot-rest above the latter and for permitting easy pivotal movement of the chair by a person sitting on the chair with one foot applied to the supporting surface between said legs and the other foot resting on the foot-rest, said rollers capable of rolling along any direction on said supporting surface.

4,426,116

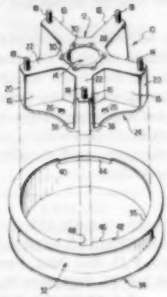
TIRE RIM AND SPOKE ARRANGEMENT TO DISCOURAGE TIRE THEFT

Paul B. Spivey, Jacksonville, Fla., assignor to Seaboard Coast-Line Railroad Co., Jacksonville, Fla.

Filed Aug. 11, 1982, Ser. No. 407,126

Int. Cl.³ B60B *1/00, 23/00*

U.S. Cl. 301—9 R **4 Claims**



1. In combination, a cylindrical rim, designed to carry a tire around an outer perimeter thereof, and axially slidably receivable, along an inner peripheral surface, over a hub having a plurality of spokes, said hub having a central portion with an axially exending opening therein designed to receive an end portion of an axle for rotatable movement of said hub on said axle, said spokes extending radially outwardly, in spaced relationship, from said central portion and terminating in outwardly directed peripheral faces which are circumferentially disposed at the same distance radially from said central portion, said spokes also extending axially on said hub, said rim being slidably receivable axially over said peripheral faces of said spokes along an axial length thereof and being selectively securable thereon, the improvement comprising:

A. Notches formed adjacent the peripheral face of one of said spokes and reducing the circumferential width of said peripheral face; and

B. A pair of raised areas extending toward each other at spaced apart and diametrically opposed portions of the inner peripheral surface of said cylindrical rim, each of said areas having circumferentially extending faces and each of said faces being concentrically disposed with respect to said inner peripheral surface of said rim, one of said raised areas having a notch therein at the circumferentially extending face thereof, said notch being of a width, circumferentially, greater then the circumferial width of said peripheral face of said one spoke of said hub; whereby said rim is axially slidably receivable over said hub when said peripheral face of said one of said spokes is received within said notch and the other area is received in a space between a pair of said spokes other than said one spoke, and whereby said rim is not slidably receivable over a hub not having, on one spoke thereof a compatable notched peripheral face.

4,426,117

BRAKE PRESSURE CONTROL VALVE AND A METHOD FOR ITS ASSEMBLY

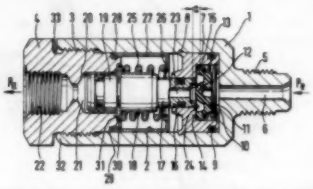
Jochen Burgdorf, Offenbach-Rumpenheim, and Karl Keiner, Schoeffengrund, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 26, 1981, Ser. No. 296,394

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037459

Int. Cl.³ B60T *8/26*

U.S. Cl. 303—6 C **14 Claims**



1. A brake pressure control valve for a vehicular brake system comprising:

a housing having a longitudinal axis, a single inlet adjacent one end thereof coaxial of said axis and a single outlet adjacent the other end thereof coaxial of said axis;

a threaded plug screwed into said housing at said outlet coaxial of said axis, said plug having a first bore therein coaxial of said axis;

a stepped piston disposed in said housing coaxial of said axis having a larger-diameter portion guided in said first bore and a smaller-diameter portion guided in a second bore formed in said housing adjacent said inlet coaxial of said axis, said piston having a channel therein coaxial of said axis, said channel having a valve seat at an end thereof adjacent said inlet, said piston being axially slidable from a predetermined inactive position in a closing direction of said valve against the force of a valve spring bearing against a fixed stop adjacent said second bore, said fixed stop being secured to said plug adjacent said first bore; and

a spring-loaded valve closure member disposed in said housing coaxial of said axis adjacent said inlet in a cooperative relationship with said valve seat, said closure member having an inactive position defined by a support formed in said housing.

4,426,118

FLUID BEARINGS

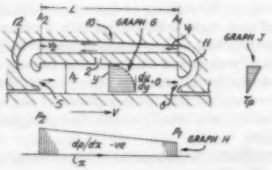
Mohamed E. Mohsin, Manchester, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 39,440, May 15, 1979, Pat. No. 4,307,918. This application Nov. 3, 1981, Ser. No. 317,857

Claims priority, application United Kingdom, Nov. 7, 1980, 8035914

Int. Cl.³ F16C *32/06*

U.S. Cl. 308—5 R **9 Claims**



1. A fluid bearing comprising:

first and second bearing members, adapted for relative

movement relative the one to the other and separated by a fluid film in use;

a recess formed in said first bearing member and adapted for connection in use to a pressurized supply of fluid; said recess presenting leading and trailing ends relative to said relative movement, and also presenting a mouth region confronting the surface of said second bearing member;

means defining a circulation path including a conduit defined by bounding walls, an inlet to said conduit located in proximity to said mouth region and to said trailing end of said recess, and an outlet from said conduit into said recess located in proximity to said mouth region and to said leading end of said recess, whereby in use said fluid may circulate from said mouth region through said inlet and said conduit and back through said outlet into said mouth region;

and pressure-enhancing means included in said conduit and adapted in use to interact with said circulating fluid whereby to cause the pressure of said fluid at said outlet to be higher than said pressure of said fluid at said inlet.

4,426,119

BALL BEARING SLIDE UNIT FOR LINEAR MOTION

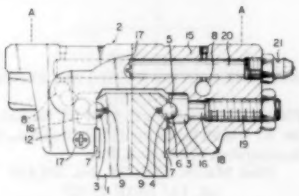
Tatsuo Mottate, Yokohama, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,764

Claims priority, application Japan, Apr. 20, 1981, 56-56977[U]; Jun. 26, 1981, 56-100102

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **3 Claims**



3. A ball bearing slide unit for linear motion wherein said slide unit is mounted on a track rail of rectangular cross section having linear track surfaces symmetrically at both vertical side surfaces, said slide unit including a body provided with track surfaces opposing said track surfaces on said track rail, with linear return holes running parallel to said track surfaces, and with direction changing paths which connect both ends of said track surfaces and said return holes respectively, said body track surfaces, return holes, and direction changing paths forming circulating paths where groups of balls endlessly circulate supporting a load and rolling between both track surfaces, track end retainers which make contact externally with both ends of the track surfaces of the track portion provided symmetrically at the channel shaped inner surfaces of the slide unit body and with both ends of the return holes and which form part of the direction changing paths which connect said track surfaces to said return holes, and side plates which make contact externally with said track end retainers and which form said direction changing paths together with said track end retainers, said track end retainers and said side plate being of large circular shape in general, and the portion providing the direction changing paths which connect to said return holes projecting outwardly in an upwardly inclined direction forming circular ear like shapes, and thus providing a bear head like contour, said track end retainers and said side plates being mounted in like shaped recesses in said body, and also in that a mounting hole drilled on the slide unit for fastening an attached body fixedly on said slide unit is formed with a female thread portion located at the upper part of the hole and is formed with a cylindrical guide surface located at the lower part of the hole with sufficient length to accurately and securely fit, guide and hold a mounting bolt from the bottom, and the top surface of the slide unit is finished for mounting and the bottom surface around the mounting hole is counterbored to be a regulating surface for mounting.

4,426,120

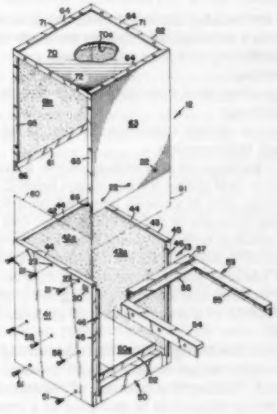
SECTIONED CABINET FOR ROOM AIR CONDITIONING UNIT

Walter T. Johnson, Fridley, and Nelson B. Gross, Champlin, both of Minn., assignors to McQuay Inc., Minneapolis, Minn.

Filed Apr. 20, 1981, Ser. No. 255,555

Int. Cl.³ A47B *87/00*

U.S. Cl. 312—100 **3 Claims**



1. A sectioned cabinet for a vertical, room air conditioning unit, comprising:

a lower housing section having walls defining a generally rectangular enclosure and a cross-section of predetermined dimensions;

means attached within said lower housing section for supporting air conditioning components including a heat exchanger and a blower;

an upper housing section including walls defining a generally rectangular enclosure and a cross-section substantially the same as said lower housing, said upper section being dimensioned to permit telescoping said upper housing section onto said lower housing section in a storage or shipment position; and

means, substantially flush with said walls while in the storage or shipment position, for securing said upper housing section to said lower housing section in stacked relationship in a use position to provide an elongate cabinet for a vertical room air conditioning unit with said upper housing section comprising an air passage for the air conditioning unit in a use position;

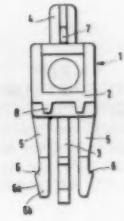
said upper and lower housing sections being square in cross section and dimensioned to permit stacking said upper housing section on said lower housing section in the use positions by rotating it one-quarter turn or one-half turn from the storage or shipment position.

4,426,121

PLUG FOR MASKING SWITCHING CONTACTS

Anneliese Stoewe, and Gunter Hegner, both of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Filed May 28, 1981, Ser. No. 267,848
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 8016168[U]
Int. Cl.³ H01R 13/44
U.S. Cl. 339—38 3 Claims



1. A plug for masking the insertion opening access to switching contacts in a terminal strip to prevent inadvertent connection to the contacts, said plug comprising:

a body portion;

an upper pulling head extending in one direction from said body portion;

spring tongue means extending in the opposite direction from said body portion;

locking projections on said spring tongue means;

extensions on said spring tongue means beneath said locking projections, said extensions being adapted for separating switching contacts in the terminal strip; and

a central guiding web extending from said body portion in the same direction as said spring tongue means;

said body portion, pulling head, spring tongue means, locking projections and central guiding web all being integrally formed of a unitary piece of electrically insulative material;

said body portion being wider than said pulling head or said spring tongue means or said central guiding web so as to fully mask the insertion opening of the terminal strip;

said plug being adapted to be mounted to a terminal strip to make externally inaccessible the insertion openings therein and to cover a substantial portion of the lateral surface of the terminal strip in the vicinity of the contact access openings, and when said plug is so mounted to the terminal strip said spring tongue means and said central guiding web enter corresponding openings in the terminal strip, and said locking projections engage corresponding recesses in the terminal strip.

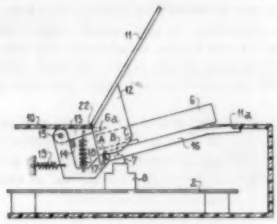
4,426,122

MICROCOMPUTER ADAPTED TO BE CONNECTED TO A SUPPLEMENTARY CIRCUIT PLACED IN A CARTRIDGE

Lucien Lainez; Gerard Brandelong, both of Moulins, and Marie N. Jacquemin, Yzeure, all of France, assignors to Thomson-Brandt, Paris, France

Filed Mar. 23, 1981, Ser. No. 246,640
Claims priority, application France, Mar. 21, 1980, 80 06403
Int. Cl.³ H01R 9/09
U.S. Cl. 339—45 M 15 Claims

1. A microcomputer comprising a casing enclosing at least one main circuit and provided with an aperture, a lid pivotally mounted on said casing and movable between an open position wherein said aperture is exposed and a closed position wherein said lid closes said aperture, said aperture being adapted to receive a cartridge enclosing at least one extension circuit adapted to be connected to said main circuit by application under pressure of connecting means associated with said extension circuit onto internal contact means associated with said main circuit, said pressure being applied when said lid is in said closed position, cartridge support means coupled to said casing and movable with respect to said lid for supporting said cartridge, means on said lid whereby motion of said lid between said positions causes said cartridge support to move relative to said lid in a predetermined manner, said microcomputer further comprising pressure limiting means for limiting the magnitude of said pressure applying said connecting means onto said internal contact means, said pressure limiting means acting over a selected range of dimensional tolerances of the cartridge, said pressure limiting means comprising elastic means connected to said cartridge support and adapted to apply, when said lid is in said closed position, a substantially constant force on a surface of said cartridge, which surface is located opposite to a surface thereof which comprises said connecting means.

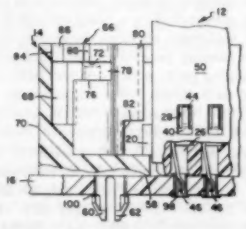


4,426,123

CAM ACTUATED ZERO INSERTION CONNECTOR ASSEMBLY

Leon T. Ritchie, Mechanicsburg; Clair W. Snyder, Jr., York, and John A. Woratyla, Camp Hill, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 9, 1981, Ser. No. 240,525
Int. Cl.³ H01R 13/62
U.S. Cl. 339—75 MP 6 Claims



1. A low entry force electrical connector system for making interconnection with an array of conductive holes of a circuit board or the like, comprising:

a plug assembly having a housing with a mating face and a plurality of terminals mounted in said housing each with a beam portion extending beyond said mating face;

a header assembly having means to mount said header assembly on a circuit board and spaced walls defining a plug receiving cavity enclosing an array of conductive holes in said circuit board, cam means mounted in one end of said header assembly adapted to act on said plug assembly whereby when said plug assembly is initially engaged in said header assembly said beam portions extend at least partially into each respective conductive hole in said circuit board and upon actuation of said cam means said

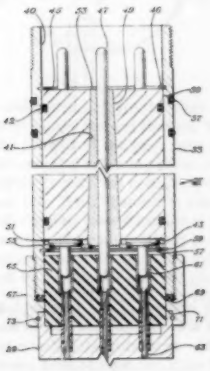
plug assembly is driven transversely with respect to said header assembly to bring said beam portions into engagement with walls of the respective conductive holes.

4,426,124

FEED THROUGH MANDREL FOR SUBMERSIBLE PUMP

Joseph E. Vandevier, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Oct. 2, 1981, Ser. No. 308,057
Int. Cl.³ H01R 9/11
U.S. Cl. 339—94 M **4 Claims**



4. In a submersible pump installation within a well of the type having a plurality of electrical conductors extending upwardly within a high pressure zone in well conduit, an improved means for connecting the conductors through a pressure barrier structure to a low pressure zone, comprising in combination:

a tubular housing mounted to a passage in the structure;

a rigid metal jacket having a cylindrical exterior sealingly received in the housing, the jacket having a conical hole extending through it for each of the conductors, with a smaller end on a low pressure end of the jacket and a larger end on a high pressure end of the jacket;

stop means on the low pressure end of the jacket for preventing movement of the jacket toward the low pressure zone;

a conductor rod for each conductor, each conductor rod having a sheath bonded to it with a conical exterior that mates with one of the holes, the rods having ends that protrude from the jacket for connection to one of the cables in the low and high pressure zones;

a plate having an aperture for inserting around each rod, each aperture being of lesser diameter than the larger diameters of the holes, the plate bearing against ends of the sheaths on the high pressure end of the jacket to cause the sheaths to seal against the jacket; and

retaining means for retaining the plate in sufficient compression against the sheaths to form a seal between the sheaths and jacket to prevent pressure leakage through the holes of the jacket;

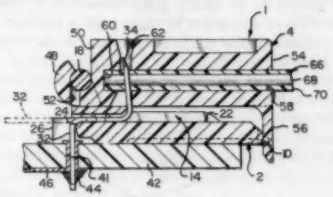
the sheaths being of a material selected from the group consisting of glass bonded mica, ceramic, and aluminum oxide.

4,426,125

FLAT CABLE ELECTRICAL CONNECTOR

Christopher L. Crawford, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburgh, Pa.

Continuation-in-part of Ser. No. 204,099, Nov. 5, 1980, Pat. No. 4,341,430. This application Aug. 20, 1981, Ser. No. 294,675
Int. Cl.³ H01R 23/66
U.S. Cl. 339—99 R **4 Claims**



1. A flat conductor cable electrical connector, comprising, a base, a holder pivoted to the base and having a pocket receiving multiple electrical conductors of a flat conductor cable, multiple electrical terminals mounted on the base and having terminal lead portions projecting from the base, conductor engaging portions projecting toward the pocket for penetrating the cable and engaging respective conductors to establish electrical connections therewith, the base being integrally formed with a hinge pin located along a first end, the cover being integrally formed with hook portions located along a first end and pivotally mounted on the hinge pin, the cover providing a rigid cable supporting enclosure and having terminal guiding channels therein intercepting the cable receiving pocket; the conductor engaging portions being remote from the guiding channels allowing receipt of the cable in the pocket without impediment so that upon pivoting the holder toward the base, the conductor engaging portions enter into the channels and penetrating the cable and establishing electrical connections with the conductors, the holder comprising a manually actuatable lever projecting outwardly away from the hook portions, and the conductor engaging portions of the terminals being located nearer the axis of the hinge pin then a second end of the base opposite the first end of the base.

4,426,126

LIGHTING FIXTURE CONNECTING DEVICE WITH SAFETY MEANS

Hendrik A. J. De Vos, and Elzear R. Labouliere, both of Swansea, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov., 1981, Ser. No. 318,184
Int. Cl.³ H01R 13/46
U.S. Cl. 339—125 R **9 Claims**

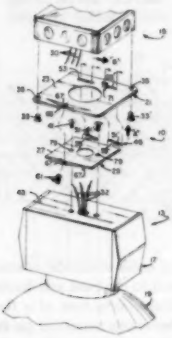
1. A device for connecting a substantially vertically oriented lighting fixture to an electrical junction housing, said device comprising:

a first plate member for being secured to said electrical junction housing and including at least one elongated opening therein;

a second plate member for being secured to said lighting fixture and for being removably connected to said first plate member, said second plate member including at least one projecting tab member located thereon or forming part thereof and adapted for being inserted within said elongated opening of said first plate member in a first direction and thereafter moved in a second direction to engage said first plate member, said second plate member adapted for occupying a first, closed position against said first plate member and for pivoting to a second, open position located at a predetermined angle from said first plate member;

means for detachably securing said first and second plate

members when said second plate member occupies said first, closed position against said first plate member, and safety means for preventing accidental removal of said second plate member from said first plate member when said second plate member occupies said second, open position with respect to said first plate member, said safety means



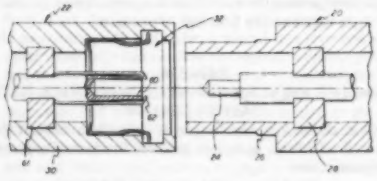
including a projecting segment located on or forming part of said first plate member, said tab member engaging said projecting segment when said second plate member occupies said second open position to prevent said tab member from moving in a direction substantially opposite to said second direction.

4,426,127

COAXIAL CONNECTOR ASSEMBLY

James Kubota, Amherst, N.H., assignor to Omni Spectra, Inc., Merrimack, N.H.

Filed Nov. 23, 1981, Ser. No. 324,113
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—177 R **11 Claims**



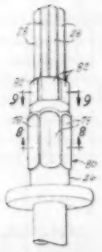
6. A connector assembly of the pluggable type for electrically coupling two ends of a coaxial circuit configuration including (A) a male plug assembly comprising (1) an electrically conductive inner conductor pin member for electrical connection to a coaxial circuit inner conductor, and (2) an electrically conductive outer conductor member, electrically isolated from and surrounding said electrically conductive pin member in part, and (B) a mating female receptacle assembly having a bore of generally complementary profile for accommodating said male plug assembly, said female receptacle assembly comprising (1) an electrically conductive inner conductor contact member for receiving and contacting said male plug assembly inner conductor pin member, (2) an electrically conductive outer conductor contact member electrically isolated from and surrounding said electrically conductive inner conductor contact assembly in part, for receiving and contacting said male plug assembly outer contact member, said female receptacle assembly outer conductor contact member having a resiliently flexible spring contact member which is (a) normally displaced in part from contact with said receptacle bore interior profile, and which, upon engagement of said male plug assembly electrically conductive outer conductor member (b) flexes outwardly to more closely conform to said receptacle bore interior profile, and which, upon continued insertion of said male plug assembly (c) presses progressively into engagement with said male plug assembly electrically conductive outer conductor member, and (3) an electrically conductive hood member electrically connected to and surrounding, in part, said female receptacle assembly inner conductor contact member, said resiliently flexible spring contact member comprising an electrically conductive elastomer.

4,426,128

BRUSH CONTACTS

Samuel J. Costello, Nineveh, and Eric R. Sohne, Hartwick, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 9, 1981, Ser. No. 319,496
Int. Cl.³ H01R *4/18*
U.S. Cl. 339—276 T **5 Claims**



1. In a brush contact of the type including a plurality of parallel contact wires having one end of each received in one end of a formable metal elongated sleeve holder, said contact wires arranged with one wire located centrally of the rest of said contact wires, each of the rest of said contact wires arrayed about the periphery of said centrally located contact wire; with the holder formed with a plurality of crimps substantially aligned about the circumference of said holder and each of said recesses extending along the length of said holder and also extending inwardly to retain the contact wires therein, the improvement wherein said plurality of crimps comprise a number of generally Vee-shaped crimp recesses having sides formed into said holder arranged about the circumference of said holder, and the sides of said crimp recesses extending parallel to the length of said holder; said number of said crimp recesses being one less than the number of said contact wires; and each crimp recess extending inwardly intermediate an adjacent pair of said contact wires arrayed about said centrally located contact wire.

4,426,129

OPTICAL FIBER AND METHOD OF PRODUCING THE SAME

Hiroyoshi Matsumura, Saitama; Toshio Katsuyama, Hachiouji, and Tsuneo Suganuma, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

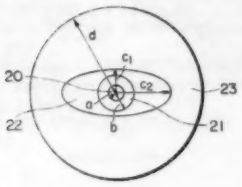
Filed Jan. 9, 1981, Ser. No. 223,747
Claims priority, application Japan, Jan. 11, 1980, 55-1330; Mar. 7, 1980, 55-28149; Aug. 18, 1980, 55-112741
Int. Cl.³ G02B *5/14*; C03B *19/00*
U.S. Cl. 350—96.33 **12 Claims**

1. An optical fiber having an optical waveguide and a jacket mounted on said waveguide, characterized in that said waveguide comprises a circular core and a circular cladding having a refractive index lower than that of said core, and said jacket consists of a first jacket having an elliptical outer shape and

formed on said waveguide and a second jacket having a circular outer shape and formed on said first jacket.

8. A method of producing a preform rod for an optical fiber having a circular core, an elliptical intermediate layer and an outermost layer having a substantially circular surface, comprising the steps of:

(1) forming a plurality of glass layers on the inner wall of a glass tube, the innermost core layer of the glass layers being made of a glass material having a softening point higher than that of an intermediate layer between said glass tube and said innermost core layer, and said glass tube having a higher softening point than that of said intermediate layer;



(2) heating and collapsing a part of the glass tube having said plurality of glass layers formed thereon; and thereafter

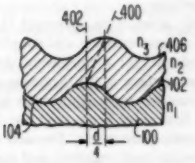
(3) collapsing the portion of the glass tube not collapsed in step (2) by movement of a heating means heating the glass tube from said part heated for collapsing in step (2) to the portion of said tube not collapsed in step (2), under the conditions that the glass tube is rotated at a predetermined speed and the internal pressure of said glass tube is lower than the pressure outside of said glass tube, whereby the core is formed to be circular and the glass tube has said substantially circular surface, and the intermediate layer becomes said elliptical intermediate layer.

4,426,130

SEMI-THICK TRANSMISSIVE AND REFLECTIVE SINUSOIDAL PHASE GRATING STRUCTURES

Karl H. Knop, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Feb. 19, 1981, Ser. No. 235,972
Int. Cl.³ G02B 5/18
U.S. Cl. 350—162.2 **22 Claims**



1. A sinusoidal phase grating structure responsive to wave energy including a given wavelength λ traveling in an entering medium exhibiting a first index-of-refraction n_1 that is incident on said structure at a given angle of incidence α; said structure comprising:

first means including a first effective sinusoidal phase grating of a given line spacing d and a physical amplitude A_x, said first grating being formed by a relief pattern on a first surface of a layer of thickness t of material that is substantially transparent to wave energy of said wavelength λ and which exhibits a second index of refraction n_2 different from n_1, said first surface of said layer being bound by said entering medium, said first means diffracting said incident wave energy at said first surface into at least angularly divergent zero and first diffraction orders traveling in said layer toward a second surface thereof situated opposite the first surface thereof; and

second means including a second effective sinusoidal phase grating of said given time spacing d and a physical amplitude A_y, said second grating being formed by a relief pattern on said second surface of said layer, said second surface of said layer being bound by an exiting medium that exhibits a third index-of-refraction n_3 different from n_2, said second means diffracting said respective diffraction orders traveling in said layer and incident on said second surface and thereby giving rise in said exiting medium to interfering diffraction orders that combine to form an output beam corresponding to a first diffraction order, said output beam containing a certain proportion of said incident wave energy having a value which is a function of the respective values of λ, α, d, n_1, n_2, n_3, t and the arithmetic mean of A_x and A_y;

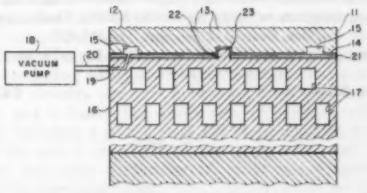
wherein λ, α, d, n_1, n_2, n_3, t, A_x and A_y have respective values that provide a value for said certain proportion of said incident wave energy in said output beam which is significantly greater than 34%.

4,426,131

REPLACEABLE DIFFRACTION GRATINGS FOR COOLED LASER OPTICS

John G. Gowan, London, England, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 13, 1982, Ser. No. 339,206
Int. Cl.³ G02B 5/18
U.S. Cl. 350—162.2 **2 Claims**



1. An optical diffraction grating device, for a high energy laser system having a cooled surface for supporting laser optics, which comprises:

a. a thin disk of substantially single crystal silicon having substantially flat, parallel first and second surfaces;

b. a plurality of grating lines on said first disk surface;

c. an annular groove on said second disk surface; and,

d. vacuum means, communicating with said groove, for holding said second disk surface in substantial contact with said cooled surface of said laser system.

4,426,132

PROJECTING DEVICE

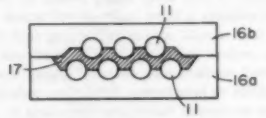
Atsuo Tsunoda, Fuchu; Koyo Midorikawa, Tokyo; Hidetoshi Murase, Yokohama; Mikio Suzuta; Masazumi Moriwaki, both of Tokyo; Noritaka Mochizuki, Yokohama; Setsuo Minami, Kawasaki, and Yoshiya Matsui, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 166,965, Jul. 8, 1980, abandoned. This application Jun. 7, 1983, Ser. No. 500,804
Claims priority, application Japan, Jul. 13, 1979, 54-89108
Int. Cl.³ G02B 27/18
U.S. Cl. 350—167 **7 Claims**

1. A projecting device, comprising:

plural element lens systems, each system composed of at least one bar lens adapted for imaging a part of the object

as a part of a corresponding projected image, each bar lens having an axial length larger than its effective diameter; wherein said plural element lens systems, when viewed from one end, are arranged in at least two rows and in a staggered fashion with one row displaced relative to the adjacent row by a distance equal to half the pitch of the adjacent row;



two grooved blocks in face to face relation for arranging said plural element lens systems with the grooves of said blocks defining two rows which extend in a particular direction perpendicular to the optical axes of said systems; and

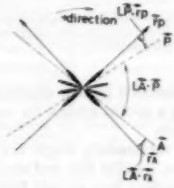
an opaque elastomer material filled in the space between the rows of said element lens systems for preventing light from entering into the space and for permitting fine adjustment of the grooved blocks.

4,426,133

TWISTED NEMATIC LIQUID CRYSTAL DISPLAY PANEL

Fumiaki Funada, Yamatokoriyama; Shigehiro Minezaki, Ikoma; Syuichi Kozaki, Nara, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1980, Ser. No. 219,450
Claims priority, application Japan, Dec. 26, 1979, 54-173728
Int. Cl.³ G02F 1/13, 1/133
U.S. Cl. 350—334 **9 Claims**



1. A twisted nematic liquid crystal display cell comprising first and second substrates, first and second polarizers associated with the first and second substrates, respectively, a liquid crystal material between said substrates, wherein the longitudinal axes of molecules of the liquid crystal material are twisted by substantially 90 degrees between the first and the second substrates, characterized in that:

a first angle A P is substantially 74° to 84°, a second angle P r_P is substantially 3° to 8°, and

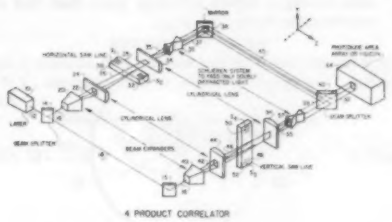
a third angle A r_A is substantially −3° to −8° wherein the positive direction of angular rotation is defined as the direction of the helical angle of the liquid crystal material, P and A are the polarization directions of the first and second polarizers, respectively, r_P is the direction of the longitudinal axes of liquid crystal molecules adjacent the first polarizer having the direction of polarization P, and r_A is the direction of the longitudinal axes of liquid crystal molecules adjacent the second polarizer having the direction of polarization A.

4,426,134

THREE AND FOUR PRODUCT SURFACE-WAVE ACOUSTO-OPTIC TIME INTEGRATING CORRELATORS

Irwin J. Abramovitz; Norman J. Berg, both of Baltimore, Md., and Michael W. Casseday, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 2, 1981, Ser. No. 317,687
Int. Cl.³ G02F 1/11
U.S. Cl. 350—358 **12 Claims**



4 PRODUCT CORRELATOR

1. A device for processing spread-spectrum and other wideband communications and radar signals to obtain at least a three product, time integrated, correlated output signal, comprising:

a source of a laser light beam;

beam splitting means for splitting the laser light beam into a first beam and a second beam;

first beam forming means for forming the first beam into a first sheet beam;

second beam forming means for forming the second beam into a second sheet beam, the plane of the second sheet beam being orthogonal to the plane of the first sheet beam;

a first acousto-optic medium, having an axis and a planar surface extending between opposite first and second ends, which is disposed in the path of the first sheet beam such that the first sheet beam traverses the first medium intermediate the first medium ends along and parallel to the first medium surface;

a second acousto-optic medium, having an axis and a planar surface extending between opposite first and second ends, which is disposed in the path of the second sheet beam such that the plane of the second medium surface is normal to the plane of the first medium surface and the second sheet beam traverses the second medium intermediate the second medium ends along and parallel to the second medium surface;

a first acoustic transducer, disposed at the first end of the first acousto-optic medium and supplied with a first signal to be correlated, for propagating the first signal on the first medium surface in the direction of the second end of the first acousto-optic medium so as to cause a first diffraction of the first sheet beam with the first signal;

a second acoustic transducer, disposed at the second end of the first acousto-optic medium and supplied with a second signal to be correlated, for propagating the second signal on the first medium surface in the direction of the first end of the first acousto-optic medium so as to cause a second diffraction of the first sheet beam with the second signal;

a third acoustic transducer, disposed at the first end of the second acousto-optic medium and supplied with a third signal to be correlated, for propagating the third signal on the second medium surface in the direction of the second end of the second acousto-optic medium so as to cause a first diffraction of the second sheet beam with the third signal;

first beam shaping means, disposed in the path of the diffracted first sheet beam, for shaping the diffracted first sheet beam into a first rectangular beam;

second beam shaping means, disposed in the path of the

diffracted second sheet beam, for shaping the diffracted second sheet beam into a second rectangular beam;

beam combining means for combining the first and second rectangular beams; and

time integrating photodetecting means, disposed in the path of the combined beans for generating the at least three product, time integrated, correlated output signal from the combined beams.

4,426,135

LENS ATTCHMENT FOR FORMING WIDE-RANGING IMAGES

Minoru Hashiya, Tokyo, Japan, assignor to Shinano Kikaku Co., Ltd., Tokyo, Japan

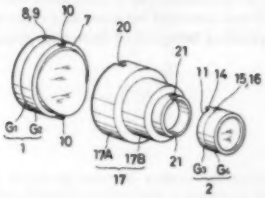
PCT No. PCT/JP79/00003, § 371 Date Jan. 22, 1980, § 102(e) Date Aug. 13, 1979, PCT Pub. No. WO79/01091, PCT Pub. Date Dec. 13, 1979

PCT Filed Jan. 5, 1979, Ser. No. 194,297

Claims priority, application Japan, May 22, 1978, 53/61295; Nov. 17, 1978, 53/142462

Int. Cl.³ G02B 7/02, 13/08, 15/02

U.S. Cl. 350—422 3 Claims



1. A lens attachment for forming wide-ranging images, which comprises a master lens **3**, a front member **1** and a rear member **2**, said front member and rear member including cylindrical lenses and being located in front of said master lens, said cylindrical lenses being made of optical plastics and being combined on a mount **17**, said each lens and said mount including tenons and recesses so as to allow said lenses and said mount to be connected from one to another in a fitting relationship, said tennons and said recesses being produced axially with the lens axis, whereby precise centering of said lenses is provided by engaging the tennons and recesses of said lenses and by engaging said tennons and recesses of said lenses and said mount.

4,426,136

PROJECTION LENS WITH LONG WORKING DISTANCE

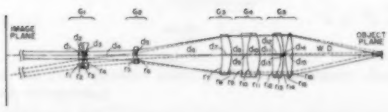
Hideo Hirose, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 5, 1981, Ser. No. 260,775

Claims priority, application Japan, May 16, 1980, 55-64050

Int. Cl.³ G02B 9/62, 9/64

U.S. Cl. 350—463 20 Claims



1. A projection lens system with a working distance two or more times longer than the focal length of the total system for projecting a magnified image of an object, comprising in order from the image side:

diverging first lens means including a positive lens element and a negative lens element;

diverging second lens means including a negative meniscus lens element with a convex surface thereof facing toward the image side;

converging third lens means including a positive meniscus lens element with a concave surface thereof facing toward the image side;

converging fourth lens means including a positive lens composed of a mutually cemented negative lens element and a positive lens element; and

converging fifth lens means.

4,426,137

GAUSS TYPE PHOTOGRAPHIC LENS

Ikuo Mori, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,364

Claims priority, application Japan, Feb. 10, 1981, 56-17404

Int. Cl.³ G02B 7/04, 9/42

U.S. Cl. 350—471 6 Claims

1. A Gauss type photographic lens for forming an image of an object at a predetermined image plane comprising, in succession from the object side, a first lens component of positive refractive power including a positive meniscus lens having its convex surface facing the object side and being disposed at a fixed distance from the image plane, a second lens component of negative refractive power including a positive lens and a negative lens and being disposed at a fixed distance from the image plane, a third lens component of negative refractive power including a negative lens and a positive lens and being disposed movably along the optical axis relative to the image plane, and a fourth lens component of positive refractive power including a positive lens and being disposed movably along the optical axis relative to the image plane, said photographic lens being constructed so that focusing thereof is effected by movement of both said third and fourth lens components, but by different amounts, whereby improved aberration correction for short distance focusing is achieved.

4,426,138

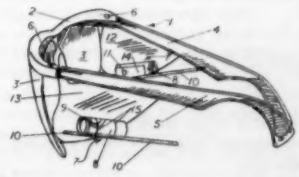
HEAD POSITIONING DEVICE

John J. Sheridan, 1551 Calhoun St., New Orleans, La. 71108

Filed Aug. 27, 1981, Ser. No. 296,887

Int. Cl.³ G02C 1/08, 1/00

U.S. Cl. 351—158 10 Claims



1. A head positioning device comprising:

(a) eyeglasses having a lens frame and rearwardly extending temple arms; and

(b) at least one level indicating means pivotally carried by at

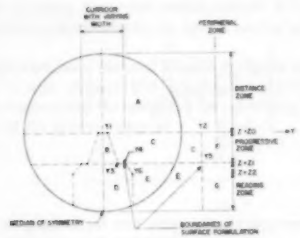
least one of said temple arms and pivotally adjustable with respect to said temple arms to facilitate a desired spatial attitude of the head when said eyeglasses are worn by a user.

4,426,139

PROGRESSIVE ADDITION LENS

Raoul F. van Ligten, and Yeo K. Kee, both of Singapore, Singapore, assignors to Polycore Optical Pte. Ltd., Singapore, Singapore

Continuation-in-part of Ser. No. 322,431, Nov. 18, 1981, abandoned. This application Apr. 8, 1982, Ser. No. 366,540
Int. Cl.³ G02C *7/06*
U.S. Cl. 351—169 **6 Claims**



1. A progressive power lens having a distance portion at the top and a reading portion at the bottom connected by a central corridor wherein the power varies in said central corridor and merges smoothly into said distance and reading portions wherein said central corridor is defined by X_2 as the height measured from the reference plane (y, Z) in mm as follows:

$$X_2 = t_1 + \& + t$$

$$t_1 = C[p(Z-3)^3 + qy^2(Z-3)^2 + ry^2(Z-3)]$$

& = formulation of distance portion
t correction term to satisfy boundary conditions with

$$\text{distance portion} = -(t_2 + d_1 Z) + \frac{500}{A_1} - \sqrt{\left(\frac{500}{A_1}\right)^2 - y^2 - Z^2}$$

$$t_2 = (t_1)^{y=0}_{Z=0}$$

$$d_1 = \left(\frac{\partial t_1}{\partial Z}\right)^{y=0}_{Z=0}$$

$$A_1 = (A_2)^{y=0}_{Z=0}$$

$$A_2 = \frac{1000\,(n-1)}{2}\left[\frac{1}{\rho_1} + \frac{1}{\rho_2}\right]$$

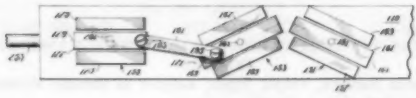
n = refractive index of lens material
ρ_1 and ρ_2 are principal radii of the surface defined by t_1
y = coordinate of y
Z = coordinate of Z
C is a constant connected with the addition of power from the distance to the reading portion in diopters
$0 < p \leqq 14$
$q \geqq 0$
$r \geqq 8$.

4,426,140

REFRACTOR SUSPENSION SYSTEM

Donn E. Stephens, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Aug. 11, 1980, Ser. No. 177,145
Int. Cl.³ A61B *3/02*
U.S. Cl. 351—204 **5 Claims**



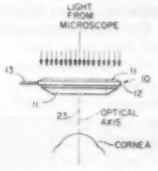
1. Apparatus for supporting and positioning the halves of refractor, each half having an optical axis, said apparatus comprising:
(a) support means;
(b) refractor support plate; and
(c) means, secured between said support means and said refractor support plate, for pivoting said refractor support plate about an axis substantially coincident with an axis in the plane of and centered between said optical axes said means for pivoting being offset from said plane.

4,426,141

BRIGHT RING KERATOSCOPE

Harry F. Holcomb, 4501 Mission Bay Dr., San Diego, Calif. 92100

Filed Apr. 23, 1981, Ser. No. 256,754
Int. Cl.³ A61B *3/10, 3/00*
U.S. Cl. 351—212 **10 Claims**



1. A device for judging corneal astigmatism comprising
a retaining means,
a transparent ring held in said retaining means and including
a flat polished top surface,
inner and outer surfaces depending from opposite edges of said top surface,
and a beveled unpolished surface on the opposite surface from said top surface.

4,426,142

CAMERA EMPLOYING A FLASH ILLUMINATION DEVICE AND A FLASH PHOTOGRAPHING SYSTEM

Yukio Iura, Yokosuka; Masayoshi Yamamichi, Kanagawa; Takashi Uchiyama, Kanagawa; Tetsuya Taguchi, Kanagawa, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

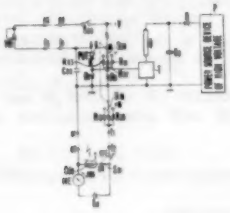
Continuation of Ser. No. 50,325, Jun. 20, 1981, Pat. No. 4,319,814, which is a continuation of Ser. No. 731,225, Oct. 12, 1976, abandoned, which is a continuation of Ser. No. 563,446, Mar. 31, 1975, abandoned. This application Oct. 29, 1981, Ser. No. 316,516

Claims priority, application Japan, Apr. 1, 1974, 49-36793; Apr. 1, 1974, 49-36794

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.³ G03B *7/085, 15/05*

U.S. Cl. 354—412 **37 Claims**



12. An exposure control system according to claim **11**, wherein the defining means has a coupling member for coupling the camera to different interchangeable objective lenses, the initial position of said member being the same for each interchangeable objective lens.

4,426,143

OVEREXPOSURE INDICATOR FOR AN AUTOMATIC ELECTRONIC FLASH

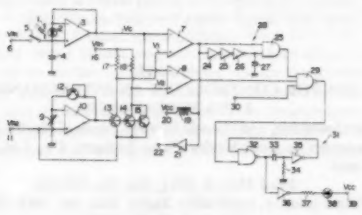
Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,204

Claims priority, application Japan, Oct. 21, 1981, 56-168233

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—416 **9 Claims**



1. An overexposure indicator for an automatic electronic flash, comprising:

means for producing and delivering an emission terminate signal to an electronic flash whenever an amount of exposure provided by light reflected from an object being photographed which is illuminated by flashlight from an electronic flash reaches a proper value corresponding to a preset film speed;

means responsive to the emission terminate signal for producing a time factor signal of a given duration which is synchronized with the emission terminate signal;

means for detecting an overexposure and for producing an output representing an overexposure whenever the amount of exposure provided by the light reflected from the object being photographed reaches an arbitrary multiple of the proper value;

and means for indicating the occurrence of an overexposure in response to an output from the detecting means when the time factor signal is present.

4,426,144

POWER SUPPLY UNIT SHARED BY CAMERA'S MOTOR DRIVE AND ELECTRONIC FLASH

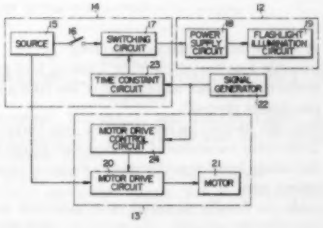
Mitsuo Kawazoe, Hachioji, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 75,223, Sep. 13, 1979, abandoned. This application Jan. 27, 1982, Ser. No. 342,992

Claims priority, application Japan, Oct. 25, 1978, 53/131426

Int. Cl.³ G03B *15/03, 1/18*

U.S. Cl. 354—145.1 **11 Claims**



1. Power supply apparatus for a camera, said power supply apparatus capable of being shared between a film winding motor drive for said camera and an electronic flash therefor, comprising:

power source means for supplying energy for operating said motor drive and said electronic flash;

means for selectively coupling energy from said power source means to said electronic flash;

detecting means for detecting the operating state of said film winding motor drive and having a first state when said motor drive is operating and a second state when said motor drive is not operating;

inhibiting means for inhibiting said means for selectively coupling energy to said electronic flash;

means coupled to said detecting means and responsive to said first state for operating said inhibiting means;

said inhibiting means including a switching circuit for inhibiting said means for selectively coupling energy to said electronic flash during the time interval that said film winding motor drive is activated;

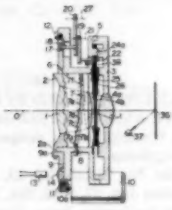
said detecting means additionally comprising detector circuit means coupled to said motor drive for detecting an activation of said film winding motor drive and for producing an energization detected signal in response thereto; and

means responsive to said film winding control signal for inhibiting said means for selectively coupling energy to said electronic flash.

4,426,145
LENS SHUTTER CAMERA

Akihiko Hashimoto, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 385,841
Claims priority, application Japan, Aug. 10, 1981, 56-125540; Aug. 10, 1981, 56-125541
Int. Cl.³ G03B *3/10, 9/08*
U.S. Cl. 354—195.1 **26 Claims**



1. A lens shutter camera comprising:

a movable lens barrel carrying a taking lens and adapted to perform a distance adjustment of the taking lens through a movement thereof;

a first cam formed on the movable lens barrel and having a continuous excursion in the direction of the optical axis of the taking lens for performing a distance adjustment of the taking lens;

a guide pin fixedly mounted on a stationary member which supports the movable lens barrel in a movable manner, the guide pin being adapted to engage the first cam;

a ring disposed for rotation about the optical axis of the taking lens;

a second cam formed in one surface of the ring and having a continuous excursion and being arranged a predetermined distance from the center of rotation thereof, the rotation of the ring in one direction causing a movement of the lens barrel and the rotation of the ring in the opposite direction occurring independent from the lens barrel and causing a shutter to be operated;

position detecting means for detecting the initial angular position of the ring as well as an angular position corresponding to a photographing distance established and an angular position where a shutter is to be operated;

said shutter including shutter blade means disposed in alignment with the optical axis of the taking lens so as to be opened and closed;

a shutter controlling electromagnet;

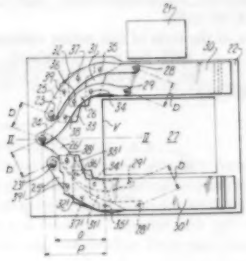
blade opening and closing means engageable with the second cam formed on the ring and including a spring which is used to close said shutter blade means and also including an interlocking mechanism connected to the shutter blade means and the shutter controlling electromagnet, the rotation of said ring being effective to open the shutter blade means by cooperation with the action of the second cam whenever the electromagnet is energized, the shutter blade means being closed by the spring whenever the electromagnet is deenergized;

and a drive source for rotating the ring.

4,426,146
FOCAL-PLANE LEAF SHUTTER

Rolf Seifert; Hans Zimmet; Herbert Welzel, and Lothar Reschke, all of Dresden, German Democratic Rep., assignors to VEB Pentacon Dresden Kamera und Kinowerke, Dresden, German Democratic Rep.

Filed Feb. 8, 1982, Ser. No. 346,835
Claims priority, application German Democratic Rep., Mar. 11, 1981, 228187
Int. Cl.³ G03B *9/36, 9/18*
U.S. Cl. 354—246 **3 Claims**



1. A focal-plane shutter for photographic cameras comprising:

(a) a support plate,

(b) first groups of shutter opening leaves having a main leaf and secondary leaves,

(c) a second group of shutter closing leaves having a main leaf and secondary leaves, the main leaves serving to form between them an exposure aperture during a part of the shutter exposure movement,

(d) a first pair of carrier levers movable in a plane parallel to the plane of the shutter,

(e) a second pair of carrier levers also movable in a plane parallel to the plane of the shutter,

(f) each carrier lever being pivotally mounted on said support plate on a first axis and pivotally mounted on the respective main leaf on a second axis, whereby the carrier levers form two parallelogram linkages with said support plate and main leaves,

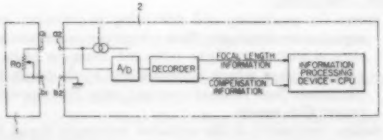
(g) said second pair of carrier levers having the same said first axis, and

(h) pivot means for connecting the secondary leaves of each group to the respective carrier levers at positions intermediate said carrier levers first and second axes.

4,426,147
MEANS FOR CONTROLLING AN INTERCHANGEABLE LENS TYPE CAMERA

Kazuo Shiozawa, and Hiroshi Sawano, , both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 355,462
Claims priority, application Japan, Mar. 16, 1981, 56-36588
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—286 **18 Claims**



1. In a controlling means for a camera for determining a photographic condition, in which there is provided on a side of

an attachable interchangeable lens an information transmission means to transmit information necessary for the determination of a photographing condition for such lens, which is fed to an information processing unit within the camera body through a contact connected at the time when the interchangeable lens is coupled to the camera body, the improvement comprising an information transmission means consisting of a first transmittable total value consisting of a first source of information which is represented by a total value which is variable stepwise over a range greater than a predetermined range, and a second source of information represented by a value variable within said predetermined range, and in which said camera body includes separating means between said contact and said information processing unit to separate the total information received from said information transmission means into said first and second sources of information.

4,426,148

MOUNTING STRUCTURE FOR DEVELOPING UNIT WITH A MAGNETIC BRUSH

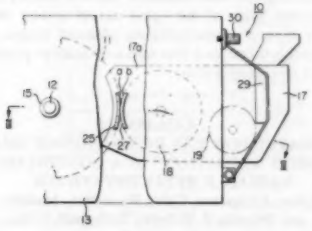
Isao Ikemoto, and Akihiko Tamura, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,253

Claims priority, application Japan, Dec. 26, 1980, 55-186486[U]

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 DD **2 Claims**



1. In a structure wherein a photosensitive substance drum is arranged between a pair of mounting plates that oppose each other, a mounting structure for a developing unit with a magnetic brush wherein a confronting surface whose distance from the center of said photosensitive substance drum is kept accurately is formed on the surface of each of said mounting plates and a contacting surface whose distance from the center of a developing sleeve of said magnetic brush is kept accurately is formed on the surface of a developing box for the developing unit with a magnetic brush and the distance between the circumferential surface of the photosensitive substance drum and the circumferential surface of the developing sleeve is obtained by making said confronting surface and said contacting surface contact.

4,426,149

PHOTOCOPIER SCANNING DRIVE SYSTEM

Klaus Kuemmel; Gerhard Klapettek, both of Giessen, and Siegfried Schneider, Biebertal, all of Fed. Rep. of Germany, assignors to Gestetner Manufacturing Limited, London, England

Filed Nov. 30, 1981, Ser. No. 326,063

Claims priority, application United Kingdom, Dec. 2, 1980, 8038559

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—8 **24 Claims**

1. A photocopier including:

(a) movable photoconductor means;

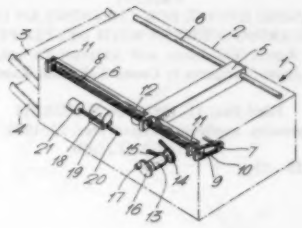
(b) means for developing an image on said movable photoconductor means;

(c) a main drive motor driving the image-developing and photoconductor means;

(d) scanning carriage means;

(e) a scanning member carried by said scanning carriage means and effective to carry out scanning of an original;

(f) a carriage drive motor for driving said scanning carriage means;



(g) exposure lamp means;

(h) means for synchronising the operation of said carriage drive motor with the operation of said main drive motor; and

(i) variable programmer means for varying the speed of said carriage drive motor to vary the ratio of proportionality of said movement of the scanning carriage means to the movement of the photoconductor means.

4,426,150

COPYING MACHINE WITH AUTOMATIC DOCUMENT FEEDER

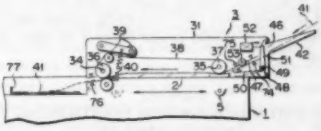
Hiroshi Matsumoto, Yokohama, and Tomoki Ogura, Ayase, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 2, 1981, Ser. No. 317,424

Claims priority, application Japan, Nov. 5, 1980, 55-155471

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 SH **3 Claims**



1. A copying machine with an automatic document feeder, comprising:

(A) a copying machine main body having

a. a document table on which is set a document,

b. copy sheet storing means for storing copy sheets,

c. sheet amount detecting means for detecting if an amount of the copy sheets in said copy sheet storing means has reached a predetermined value,

d. feeding means for individually feeding the copy sheets from said copy sheet storing means, and

e. image forming means for forming, on the copy sheet supplied by said copy sheet feeding means, an image of the document set on said document table

(B) an automatic document feeder having

a. conveying means for conveying the inserted document to said document table,

b. discharging means for discharging the document from said document table after image formation,

c. document feed inhibiting means for inhibiting supply to

said document table of a document following the document after image formation, and

d. a detector which detects insertion of the document to generate a copying start signal to said copying machine main body; and

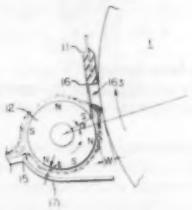
(C) controlling means for controlling said discharging means to forcibly discharge said document in response to a detection signal from said sheet amount detecting means.

4,426,151

CLEANING DEVICE FOR CLEANING AN IMAGE BEARING MEMBER WITH DEVELOPER

Yoshinori Aguro, Yokohama, and Akiyoshi Torigai, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 330,018
Claims priority, application Japan, Dec. 23, 1980, 55-183125
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **16 Claims**



1. An image formation apparatus comprising:

a movable image bearing member;

means for forming a developed image on said image bearing member with a dry developer;

means for transferring the developed image to a transfer material; and

a cleaning device, provided downstream of said transfer means with respect to the moving direction of said image bearing member, for removing developer remaining on the surface of said image bearing member, said cleaning device including means for conveying dry developer toward said image bearing member and means for bringing the developer on said conveying means into contact with the surface of said image bearing member to effect cleaning.

4,426,152

METHOD AND MACHINE FOR POSITIONING FILMS ON BASE SHEETS

Takashi Sakamoto, and Tetsuo Sano, both of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 118,190, Feb. 4, 1980, abandoned. This application May 26, 1982, Ser. No. 382,142
Claims priority, application Japan, Feb. 14, 1979, 54-14911
Int. Cl.³ G03B *27/62*
U.S. Cl. 355—75 **12 Claims**

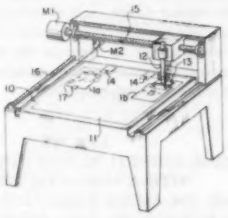
1. A method for positioning films on base sheets, comprising the steps of:

(a) laying out a first film having register mark means on a first base sheet into a desired position;

(b) detecting the position of the register mark means of the first film by a photoelectric detector means including photoelectric element means which detects the register mark means and outputs signals whose strengths are varied depending on the position of the photoelectric element means with respect to the register mark means, and wherein said step of detecting includes a step of placing a detector viewing window of the photoelectric detector means in registeration with the register mark means of the first film;

(c) overlaying a second film upon the first film, the second film having register mark means in the same position as that of the first film so that the register mark means of the second film may approximately overlap the register mark means of the first film;

(d) sensing rising and falling amounts of light received by the detector means resulting from movement of the second film across the combined reticle structure of the first film



register marks superposed on the detector viewing window; and

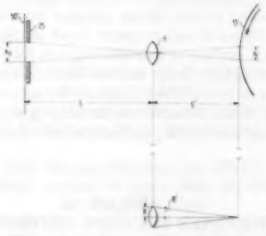
(e) moving the second film by a driving means so that the register mark means on the second film is displaced from a position outside a view of the window to a position within the view of the window and becomes coincident with the register mark means of the first film by detecting an extreme value of the signal output among the output signals from the photoelectric element means, thereby positioning the second film into a coincident position with respect to said first film.

4,426,153

APPARATUS FOR THE REDUCTION OF IMAGE INTENSITY VARIATIONS IN A CONTINUOUSLY VARIABLE REDUCING COPIER

Edwin L. Libby, Longmont, Colo.; Randall A. Maddox, Lexington, Ky., and Douglas J. Roberts, Longmont, Colo., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 50,849, Jun. 21, 1979, abandoned. This application Sep. 16, 1982, Ser. No. 419,104
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **9 Claims**



1. An electrostatic reducing copying machine for reproducing an object with a reduction in a reproduced image in the range 1:1 to 1:K, where K is less than about 0.8 and image intensity variation is ±6% or less throughout said range, comprising:

an electrostatic image carrier;

means for laying down a latent image thereon including a document support, a source of illumination directed at said document support and lens means for focusing reflected illumination onto said electrostatic image carrier;

means for continuously varying the reduction ratio in the range 1:1 to 1:K, where K is less than about 0.8 or less, wherein the improvement comprises:

a single fixed aperture means located between said lens means and said object support for reducing image intensity variations, caused by changes in said reduction ratio, and by non-uniform illumination across said object plane, and correction for lens $\cos^4$ losses, to within $\pm 6\%$.

4,426,154

LIQUID FLOW PHOTOMETER

Harald B. Steen, Oslo, Norway, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

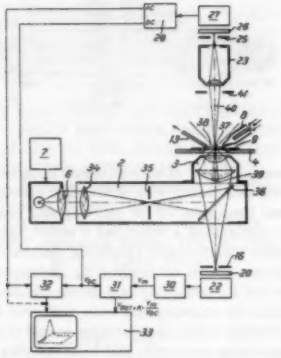
PCT No. PCT/EP80/00127, § 371 Date Jul. 22, 1981, § 102(e) Date Jul. 22, 1981, PCT Pub. No. WO81/01472, PCT Pub. Date May 28, 1981

PCT Filed Nov. 10, 1980, Ser. No. 285,096

Claims priority, application Norway, Nov. 23, 1979, 793800

Int. Cl.³ G01J *3/50*; G01N *21/49, 21/64*

U.S. Cl. 356—73 **6 Claims**



1. A liquid flow photometer for fluorescence light and/or scattered light measurement, having a measuring area (37) where particles (38) flow through comprising:

(a) a fist objective (3) positioned for focussing excitation light (5) in the measuring area (37) and also for collecting fluorescence light emanating from said measuring area, said objective being modified by a slightly transparent central stop (39) placed in the rear focal plane of said objective for causing only a very faint light transmission in a sector of said excitation light,

(b) a second objective (23) positioned for collecting the light falling within said sector (40) caused by said central stop (39),

(c) a filter (26) in the light path of said second objective (23) absorbing the fluorescence light emanating from said measuring area (37),

(d) an adjustable aperture (25) located in the image plane of said second objective (23) limiting the image field of said second objective (23) to the actual width of said measuring area (37),

(e) light detectors comprising a first light detector positioned for measuring the light intensity collected by said first objective and a second light detector positioned for measuring the light intensity collected by said second objective, and

(f) electronic amplifiers following said light detectors.

4,426,155

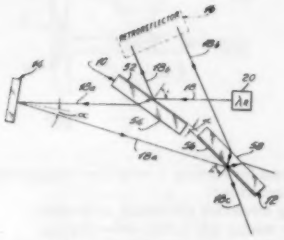
METHOD AND APPARATUS FOR THE INTERFEROMETRIC WAVELENGTH MEASUREMENT OF FREQUENCY TUNABLE C.W. LASERS

Jean-Pierre Monchalin, 4956 Earnscliffe, Montreal, Quebec, Canada

Filed Oct. 8, 1981, Ser. No. 309,583

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—346 **36 Claims**

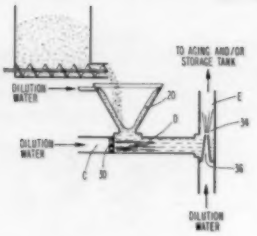


1. In a method of measuring the wavelength of an object beam of electromagnetic radiation generated from a first source means by comparing with a reference beam of known wavelength generated from a second source means in a fringe-counting Michelson-type interferometer having a stationary arm and a variable arm and including planar beam splitting means for splitting each of said reference and object beams into first and second beam portions, planar beam mixing means for recombining the respective first and second beam portions of said reference and object beams, planar reflection means arranged in said stationary arm for reflecting the respective first beam portion of said reference and object beams to said beam mixing means and movable retroreflection means having an optical center and arranged in said variable arm for reflecting the respective second beam portion of said reference and object beams to said beam mixing means, the improvement which comprises aligning said reference and object beams to provide a flat interference pattern for each of said beams sent to said beam splitting means at only one incident direction, prior to moving said retroreflection means, by causing said reference and object beams to travel along respective optical paths lying in respective parallel planes which normally intersect the planes of said beam splitting means, said beam mixing means and said reflection means and pass through the optical center of said retroreflection means, the respective second beam portion of said reference and object beams being directed to and reflected by said retroreflection means off center thereof, reflecting with said reflection means the respective first beam portion of said reference and object beams at an angle of reflection α, and disposing said beam mixing means relative to said beam splitting means such that the plane of said beam mixing means is angularly inclined with respect to the plane of said beam splitting means by an angle equal to α and that said beam mixing means is oriented to receive the respective reflected first and second beam portions of said reference and object beams symmetrically with respect to the plane thereof, whereby parallelism of said second beam portions with one another in the variable arm of the interferometer is automatically provided as a result of said alignment of said reference and object beams to a flat interference pattern, without optical feedback of said beams to their respective source means and parasitic diffraction effects by said retroreflection means.

4,426,156
POLYELECTROLYTE WETTING APPARATUS

Rosario Adamo, Belleville, and Arthur H. Patch, Wayne, both of N.J., assignors to Penwalt Corporation, Philadelphia, Pa.

Filed Aug. 13, 1982, Ser. No. 407,688
Int. Cl.³ B01F 15/02
U.S. Cl. 366—156 10 Claims



1. Apparatus for forming a lump-free solution from particulate solids comprising

containing means for containing said solids,

means for mixing said solids with a liquid,

means for dispensing said solids from said containing means into said mixing means,

means for introducing liquid into said mixing means to swirl said solids and liquid therearound to form a swirling mixture,

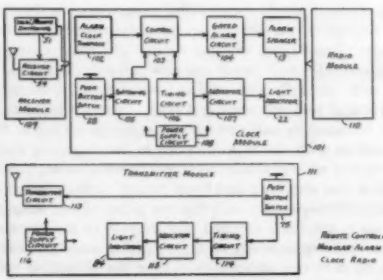
means for creating a plurality of jets of high velocity liquid upstream said mixing means to impact said mixture formed in said mixing means to form said lump-free solution, and

other means for urging said lump-free solution into aging and/or storage tanks.

4,426,157
CLOCK ALARM CONTROL SYSTEM EMPLOYING A PUSH BUTTON ALARM-DEACTIVATION SWITCH WHICH MUST BE HELD DEPRESSED FOR A TIME PERIOD

Milton W. Jetter, 201 I St., SW., Apt. 838, Washington, D.C. 20024

Filed Jan. 29, 1982, Ser. No. 343,735
The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.
Int. Cl.³ G04C 21/00
U.S. Cl. 368—73 23 Claims

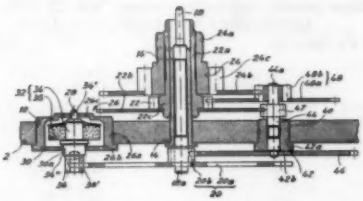


1. An alarm clock system comprising an alarm clock timepiece including alarm starting means for producing an electrical alarm signal, means to generate an audible alarm responsive to said electrical alarm signal, manually operated deactivation switch means, circuit means to deactivate said audible alarm generating means immediately upon manual operation of said deactivation switch means, means to completely deactivate said audible alarm generating means responsive to continuous manual operation of said deactivation switch means for a predetermined extended period of time, indicator means, and means to activate said indicator means upon completion of and responsive to the continuous manual operation of said deactivation switch means for said predetermined extended period of time.

4,426,158
ANALOG-DISPLAY ELECTRONIC WATCH WITH STATOR MOUNTED ROTOR, HAND SPINDLES AND GEAR TRAIN

Jacques Müller, Reconvilier, and Elmar Mock, Bienne, both of Switzerland, assignors to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Filed Feb. 19, 1982, Ser. No. 350,136
Claims priority, application Switzerland, Feb. 26, 1981, 1280/81; Mar. 6, 1981, 1505/81
Int. Cl.³ G04B 19/00
U.S. Cl. 368—76 9 Claims



1. An analog-display electronic watch comprising a casing, a glass closing said casing, and, within said casing:

hands and hand spindles for carrying said hands;

a motor comprising a rotor and a stator, said stator being provided with passages extending therethrough;

an electronic circuit for controlling said motor;

a power cell for supplying said motor and said circuit;

gear means for coupling said rotor with said hand spindles;

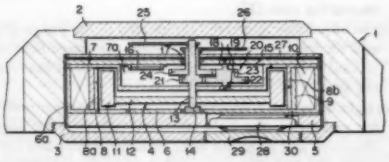
means, located within said passages in said stator, for pivotally mounting said rotor, said hand spindles and said gear means in said stator, said means being the only mounting means for said rotor, said hand spindles and said gear means; and

means for mounting said stator in said casing.

4,426,159
ELECTRONIC TIME KEEPING DEVICE

Kazumitu Kosaka, Urawa; Yukio Kido, Fussa; Shigeru Katoh, Yamato, and Hitoshi Tsutsui, Kokubunji, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 100,734, Dec. 6, 1979, abandoned. This application Apr. 7, 1982, Ser. No. 366,230
Int. Cl.³ G04B 19/04; G04C 23/02
U.S. Cl. 368—80 9 Claims



1. An electronic time keeping device comprising:

an electronic circuit for generating reference clock signals;

a stepping motor coupled to said elctronic circuit and rotatively driven in a stepwise fashion in only one direction by said reference clock signals from said electronic circuit, said stepping motor including: a disc-like hollow motor casing having a recess at the center thereof and an outer peripheral wall surrounding at least said recess, said recess extending inwardly of said motor casing; a coil provided in said hollow motor casing alaong the inner surface of said outer peripheral wall of said motor casing and having a plurality of turns wound in a circumferential direction of said outer peripheral wall; a stator having a plurality of stator segments provided in said hollow motor casing interior of said outer peripheral wall of said motor casing and arranged in said circumferential direction of said outer peripheral wall; and a rotor disposed interior of said stator and having at least a part of said rotor arranged under said recess, whereby said coil, said stator and said rotor are covered by said motor casing and assembled in one unit;

time indicating hands; and

a gear mechanism arranged in said recess of said motor casing and coupled to at least one of said time indicating hands for transmitting rotaion of said rotor of said stepping motor to said at least one of said time indicating hands.

4,426,160

DEVICE FOR MEASURING THE DEFORMATION OF A MATERIAL UNDER THE INFLUENCE OF HEAT AND ITS APPLICATION TO THE DETERMINATION OF THE WETTING POWER OF PITCHES

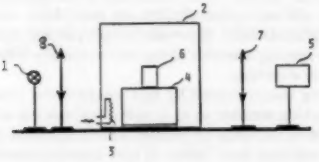
Pierre Couderc, Bethune, France, assignor to Huiles, Goudrons et Derives, Paris la Defense, France

Filed Dec. 29, 1981, Ser. No. 335,439

Claims priority, application France, Dec. 30, 1980, 80 27742

Int. Cl.³ G01N *25/04*

U.S. Cl. 374—45 **15 Claims**



1. An apparatus for measuring deformation of a material under the influence of heat, comprising:

light source means for providing a beam of light;

chamber means for receiving a deformable material therein, said chamber means being at least partially transparent for allowing light to pass at least through one wall thereof, and including porous support means for supporting said deformable material thereon, and heating means adapted to operate as a function of time for heating and causing deformation of a deformable material in said chamber means;

photo-electric receiving means; and

first optical lens means for forming an image of the deformable material in said chamber means on said photo-electric receiving means, wherein said light source means, porous support means, first optical lens means, and photo-electric receiving means are aligned optically for forming said image on said photo-electric receiving means.

4,426,161

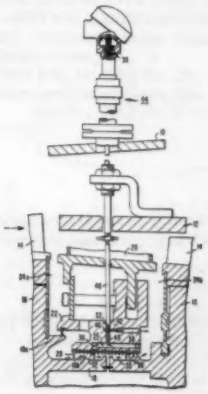
TURBINE DISC CAVITY TEMPERATURE SENSING ARRANGEMENT

Frank K. Gabriel, Springfield Township, Delaware County, and William E. North, Concord Township, Franklin County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1981, Ser. No. 333,545

Int. Cl.³ G01K *1/14*; G01N *25/00*

U.S. Cl. 374—144 **7 Claims**



1. In a turbine having a rotor with adjacent rotor discs thereof defining an interstage cavity, an arrangement for sensing temperature in said cavity comprising:

seal housing structure in said cavity separating the upstream region of said cavity from the downstream region thereof, and having its radially inner facing portions defining, with the radially outer facing portion of the rotor, a fluid leakage path between said upstream and downstream regions;

seal means in said leakage path to limit the degree of leakage therethrough;

means defining a venting passage from an intermediate location along said leakage path to said downstream region; and

an assembly in the turbine including means in said passage for sensing the temperature of the fluid flowing through said passage.

4,426,162

ROTOR SHAFT

Keiichi Tsuchiya, Tokyo; Katsukuni Hisano, Hitachi; Toshimi Tan, Hitachi; Masahiro Kobayashi, Hitachi; Kei Kobayashi, Kitaibaraki; Kazuhiko Ueda, Hitachi; Seishin Kirihara, Hitachi; Takatoshi Yoshioka, Hitachi, and Masao Shiga, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1981, Ser. No. 326,351

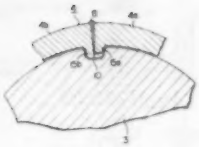
Claims priority, application Japan, Dec. 2, 1980, 55-170595; Dec. 2, 1980, 55-170597

Int. Cl.³ F16C *33/12, 33/14*

U.S. Cl. 384—280 **8 Claims**

1. A rotor shaft comprising: a rotor shaft body provided with at least one journal portion adapted to be rotatably supported by a bearing, the rotor shaft body being made of a Cr alloy steel having mainly martensite structure; and a cylindrical sleeve fitting around said at least one journal portion, said sleeve being made of a low alloy steel and being divided in a circumferential direction into a plurality of segments which are adapted to be joined together to closely fit around said at least one journal portion, said segments are provided with protru-

sions on inner surfaces thereof, said protrusions extending along joint surfaces of said segments, said at least one journal



portion of said rotor shaft is provided on a peripheral surface thereof with grooves for receiving said protrusions.

4,426,163

BEARING SUPPORT ARRANGEMENT FOR ELECTRICAL MACHINES

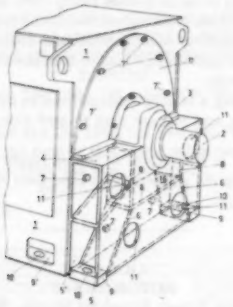
Martin Schluchter, Birr, and Max Voser, Scherz, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 27, 1982, Ser. No. 343,244

Claims priority, application Switzerland, Jan. 29, 1981, 587/81

Int. Cl.³ F16C *35/02*

U.S. Cl. 384—428 **8 Claims**



1. An electrical machine of a horizontal design comprising:

(a) a stator;

(b) a housing in which said stator is mounted, said housing having end faces and a first base for supporting the weight of said housing and said stator;

(c) a rotor;

(d) a bearing support means at each end of said housing:

(i) having integrated bearings therein which journal said rotor;

(ii) which are releasably connected to the end faces of said housing;

(iii) which extend upwardly approximately to the axial center plane of said rotor;

(iv) which extend downwardly to a second base for supporting the weight of said bearing support means and said rotor; and

(v) which are formed in a double-walled, box-like manner including an outer first wall and an inner second wall; and

(e) cover members for closing the end faces of said housing above said bearing support means.

4,426,164

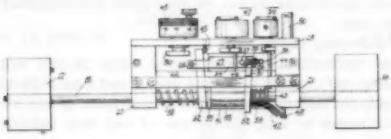
LINE SPACER FOR METAL STAMPING DEVICES

Hendrick C. Hegg, Hoffman Estates, Ill., assignor to Imperial Stamp & Engraving Co., Mt. Prospect, Ill.

Filed Jun. 1, 1982, Ser. No. 383,503

Int. Cl.³ B41J *3/28*

U.S. Cl. 400—46 **8 Claims**



1. A line spacer for a typing or marking machine having a horizontally disposed work table carried by a spacing assembly that is adapted to be moved line by line with the spacing therebetween being adjustable, comprising:

(a) an elongated stationary means supporting a work table spacing assembly for movement thereover in either direction,

(b) a work table spacing assembly freely journalled on said stationary means for movement thereover in either direction,

(c) a locking member journalled on said stationary means and positioned at an acute angle thereto so as to have releasable holding attachment thereto and in contact with said spacing assembly for preventing free movement thereof in one direction along said stationary means,

(d) a second locking element journalled on said stationary means and positioned thereon so as to have releasable holding attachment therewith for preventing movement of said spacing assembly along said stationary means is an opposite direction,

(e) moving means carried by said assembly for contacting said locking member so as to move said spacing assembly away from said locking member a predetermined distance along said stationary means in said opposite direction,

(f) means provided by said spacing assembly for contacting said second locking element for releasing the same from said stationary member as said assembly is moved away from said locking member in said opposite direction,

(g) a manually operated means carried by said spacing assembly and movable therewith by said moving means for determining the length of movement of said moving means and said spacing assembly relative to said locking member for determining the line spacing of said spacing assembly,

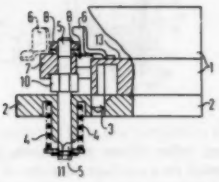
(h) means on said elongated stationary means and in contact with said locking member for moving the same over said stationary means a distance equal to the movement of said spacing assembly after each actuation of said moving means, and

(i) a releasing means for said second locking element for permitting free movement of said spacing assembly over said stationary means in said opposite direction so as to return the work table to its original position with respect to either the typing or marking machine.

4,426,165
PRINTING DEVICE WITH INTEGRATED PRINT HEAD FASTENING AND ADJUSTMENT

Otmar Irro, Feldkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,447
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1981, 3151776
Int. Cl.³ B41J 29/54, 3/10
U.S. Cl. 400—57 10 Claims

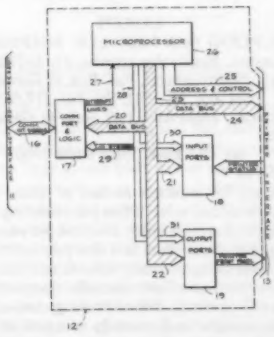


1. In a printing machine in which a printing head is releasably disposed on a carriage across from a recording medium support, apparatus for mounting the printing head to the carriage comprising a pin means mounted upstanding from said carriage and disposed for rotation, a clamping element seated at the upper end of said pin means for selectively engaging against a support surface formed on said printing head to hold said printing head on said carriage and an eccentric connected to said pin means for engaging with a cooperating surface formed on said printing head such that rotation of said pin means brings said clamping element into engagement with the support surface of said printing head and causes said eccentric to selectively displace said printing head on the carriage relative to said recording medium support.

4,426,166
MODULAR PRINTER WITH CODED PLUG COMPATIBLE MODULES

Stephen R. Bowling, Los Altos Hills, Calif., assignor to Qume Corporation, San Jose, Calif.

Filed Oct. 14, 1982, Ser. No. 434,289
Int. Cl.³ B41J 5/30, 1/60; H03K 13/34
U.S. Cl. 400—62 9 Claims

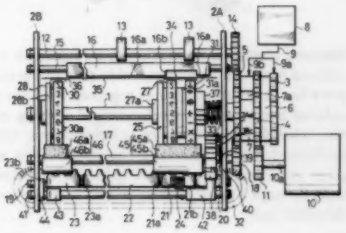


1. A system for making a written record of data received in any selected one of a plurality of communications codes, said system comprising: a communications interface constructed in accordance with one communications code; a printer interface; a printer connected from said printer interface; and one module corresponding to said one code and movable independently of said printer interface, said module being connected between said interface to convert said one code to a set of signals to operate said printer, said module and said printer interface having mating portions of a quick detachable electrical connector such that said module may be connected to said printer interface or replaced by another module with a mating connector and corresponding to another communications code.

4,426,167
SERIAL PRINTER HAVING TWO CARRIAGES CARRYING RESPECTIVE TYPE WHEELS AND MOVABLE INDEPENDENTLY

Yasuhiko Iwane, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 348,144
Claims priority, application Japan, Feb. 17, 1981, 56-21918
Int. Cl.³ B41J 11/18, 1/32
U.S. Cl. 400—159 9 Claims



1. In a serial printer of the type having a carriage carrying a type head and adapted to be shifted along a line to be printed by cooperation between a rotatable rack and a screw member, the improvement comprising: a rotary shaft adapted to be driven by a suitable driving source; a first screw member and a second screw member splined to said rotary shaft; a first carriage and a second carriage carrying said first screw member and second screw member, respectively, said first and second carriages having respective home positions defined at respective end portions of the line to be printed; spiral screw portions formed on said first and second screw members, respectively, and orientated in the opposite directions; and said rack being formed by short racks positioned at respective axial end portions of a line to be printed and each adapted to be rotated into a position engaging a respective one of said screw members when the respective carriage is at its home position and an intermediate long rack extending between said short racks; and selection means for bringing either of said first and second screw members into selective engagement with said long rack by positioning the respective short rack into engagement with the selected screw member.

4,426,168
SERIAL IMPACT PRINTER FOR MULTICOLOR PRINTING

Masao Jozuka, and Kazuhiro Ohmura, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

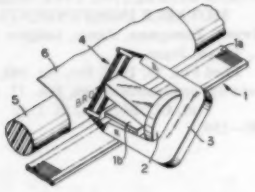
Continuation of Ser. No. 238,086, Feb. 25, 1981, abandoned.
This application Feb. 17, 1983, Ser. No. 467,337
Claims priority, application Japan, Mar. 12, 1980, 55-31165
Int. Cl.³ B41J 35/16
U.S. Cl. 400—224 8 Claims

1. In an impact printer having platen means for supporting a print paper, a ribbon cassette containing an elongated inked ribbon, carriage means, carriage driving means coupled to the carriage means for reciprocally moving the carriage means relative to said print paper along a print line, and a print head assembly mounted on the carriage means to print characters along the print line on the paper, the improvement wherein,

said inked ribbon is divided into multiple colored bands each along the longitudinal direction thereof,

said print head assembly including plural print wire units arranged along the print line, the number of said units being equal to that of said colored bands, each of said print wire units comprising a plurality of print wires, and

said ribbon cassette is mounted on said carriage means, said inked ribbon extending and moving in a direction intersecting the print line, each of said print wire units being



disposed always in opposition to a respective one of said colored bands and being movable past any points on said print line at different timings together with the respective colored band and without a vertical shifting of said ribbon, whereby the multicolor printing of said characters is performed in selected different colors even within the same print line by means of selective actuation of said units through a single shifting of said carriage means along the print line.

4,426,169

TYPEWRITING RIBBON WITH ADHESIVELY CORRECTABLE PRINT

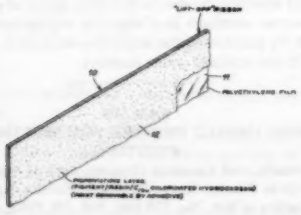
Heinz Hartmann, Mönchaltdorf, Switzerland, assignor to Franz Büttner AG, Zürich, Switzerland

Filed Sep. 1, 1981, Ser. No. 298,314

Claims priority, application Switzerland, Sep. 9, 1980, 6776/80

Int. Cl.³ B41J *31/02*

U.S. Cl. 400—241.1 **6 Claims**



1. A lift-off type correction ribbon adapted to transfer a print composition to a sheet from which the composition can be lifted off by an adhesive surface, said ribbon comprising a substrate and a coloring layer on said substrate, said coloring layer comprising at least one pigment, at least one resin binder and an effective amount of a modifying agent capable of embrittling said binder, said modifying agent including at least one halogenated hydrocarbon selected from the group which consists of cetyl chloride and stearyl chloride.

4,426,170

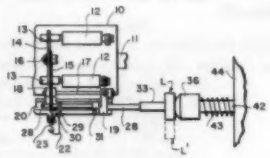
AUTOMATIC PAPER ROLLER RELEASE MECHANISM FOR TELETYPE AND ELECTRIC TYPEWRITERS

John J. Buda, 885 De Frame, Golden, Colo. 80401

Continuation-in-part of Ser. No. 147,352, May 7, 1980. This application May 17, 1982, Ser. No. 378,513

Int. Cl.³ B41J *13/036*

U.S. Cl. 400—636.1 **5 Claims**



1. In a feed roller release mechanism, for a device having a platen mounted on a carriage, a series of pressure rollers normally urged toward said platen for urging paper or the like against said platen, means for moving said pressure rollers away from said platen and means including shaft means for shifting said moving means, the improvement comprising:

a lever movable between first and second positions for moving said shaft means between positions corresponding to the positions of said rollers adjacent and urged toward said platen and said rollers being spaced from said platen;

means urging said lever toward said first position corresponding to the position of said rollers when urged toward said platen;

means for releasably holding said lever in said second position corresponding to said rollers being spaced from said platen;

electromagnetic means for causing said holding means to be released from said lever;

means for activating said electromagnetic means with said lever in said second position and movement of said carriage to a predetermined position;

said releaseable holding means includes a button engageable with a socket of said lever;

mounting means for said button movable away from said lever by said electromagnetic means; and

resilient means normally urging said button toward said lever in said second position.

4,426,171

COUPLING FOR METALLIC SCAFFOLDS

Eberhard Layher, Blankenhornstrasse 17, D-7129 Güglingen-Eibensbach, (Württemberg), Fed. Rep. of Germany

Filed Jun. 11, 1981, Ser. No. 272,563

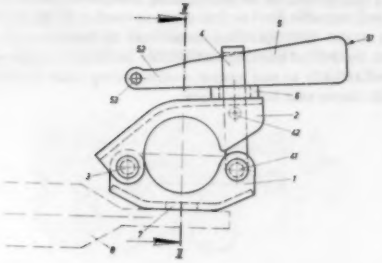
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030257

Int. Cl.³ E04G *7/00*; **F16B** *1/00*

U.S. Cl. 403—49 **13 Claims**

1. A coupling for scaffolds formed of tubes, comprising a first lever and a second lever; a first pin extending through said first lever and said second lever; a second pin mounted on said second lever and spaced from said first pin; said first lever and said second lever being pivotally mounted on said first pin and adapted to surround a scaffold tube to be clamped between said first and second levers in a form-locking connection; a yoke formed of sheet metal and pivotally mounted on said second pin, said first lever being formed with an outwardly open slot for engaging and guiding said yoke during its pivoting on said second pin; said yoke including two opposite bars spaced from each other and having inner faces; a wedge formed of sheet metal and having a longitudinal axis, said wedge being engaged between said inner faces of said bars and being slidably movable therebetween along said longitudinal axis, said wedge being adapted to lock said first and second levers on said

scaffold tube upon the slidable movement of the wedge; and means for preventing said wedge from slipping out from said



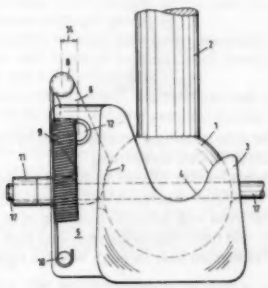
yoke, said means including at least one projection formed on at least one of said opposite bars.

4,426,172

BALL AND SOCKET JOINT FOR DUMPER TRUCKS

Karl Hildebrand, Bessemerstrasse 9, D-4006 Erkrath, Fed. Rep. of Germany

Filed Jun. 2, 1982, Ser. No. 384,225
Int. Cl.[3] F16C *11/06*
U.S. Cl. 403—122 4 Claims



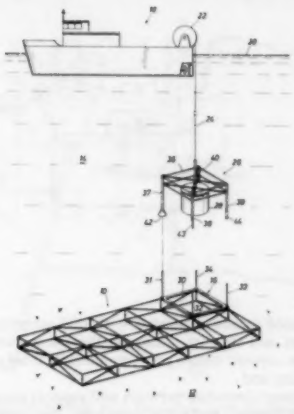
1. In a ball and socket joint for supporting a dump truck body so that said body may be rocked about at least two axes for dumping, having a stem with a ball fixed thereto, and a socket having a well for receiving said ball, said well generally conforming to the form of said ball, the improvement comprising said stem is fixed to said body so that said stem is generally upright when said body is in its non-dumping condition, an upper edge on said socket extending around said well, at least two cutouts in said edge of part-circular form for receiving said stem when said body is in a dumping position, a keeper nosepiece extending out from one side of said socket, at least one locking part pivotally mounted on said nosepiece so that it can be turned into and out of a ball-locking position, a locking face on said locking part operatively engaging against said ball for locking the ball in said well in said locking position, a crosspiece formed at the top end of said locking part, two springs symmetrically disposed on two opposite sides of said locking part, the lower ends of said springs being attached to said socket and the top ends of said springs being attached to said crosspiece to resiliently urge said locking face of said locking part against said ball.

4,426,173

REMOTE ALIGNMENT METHOD AND APPARATUS

Jene A. Richart, Houston, Tex.; Bradley D. Beitler, Ojai, Calif., and David G. Decken, Weybridge, England, assignors to Exxon Production Research Co., Houston, Tex.

Filed Aug. 27, 1981, Ser. No. 296,712
Int. Cl.[3] E21B *7/12*
U.S. Cl. 405—195 15 Claims



1. An apparatus for guidelineless alignment of equipment lowered from a vessel located at the surface of a body of water to a subsea structure located on the floor of said body of water, said apparatus comprising:

a base having an upwardly extending primary member and at least one upwardly extending secondary member, said base being located on and attached to said subsea structure;

a frame on which said equipment is mounted, said frame having a downwardly extending primary member capable of mating with said base primary member and at least one downwardly extending secondary member capable of mating with said base secondary member, said members having lengths such that said primary members engage each other before said secondary members come into contact as said frame is lowered toward said base;

means for lowering said frame form said vessel to said subsea structure;

vertical channeling means attached to at least one of said primary members and adapted to aid in channeling said primary members into engagement thereby defining a substantially vertical axis through both said base primary member and said frame primary member; and

rotational engagement means for rotationally aligning said base and said frame, said rotational engagement means attached to at least one of said secondary members and adapted to permit a predetermined amount of rotation of said frame about said substantially vertical axis and to prevent further rotation when said frame and said base are angularly aligned.

4,426,174

EASILY REPLACEABLE SHOCK ABSORBER MOUNT FOR VESSEL BUMPER ON A MARINE STRUCTURE

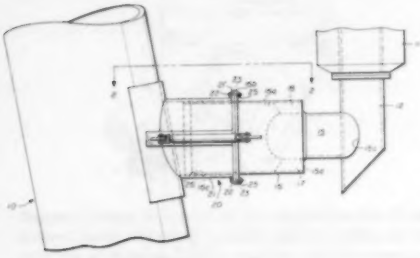
Glen E. Drewett, P.O. Box 15, Negreet, La. 71460, and Kenneth W. Guynes, New Caney, Tex., assignors to Glen E. Drewett, Negreet, La.

Filed Sep. 30, 1982, Ser. No. 428,757
Int. Cl.[3] E02B *3/22*; B63B *21/04*
U.S. Cl. 405—213 2 Claims

1. In a shock absorbing arrangement for a vessel bumper on

a marine structure wherein an annular hollow body is provided with a longitudinally extending cylinder and there being a frangible means molded between the hollow body and the cylinder to position the cylinder in the body so that it is spaced from one body end and projects out of the other body end, the invention comprising:

a. support means telescopically receiving the annular hollow body, said support means including positioning means to position the annular hollow body so that the hollow body projects longitudinally of and from said support means;



b. associated means associated with said support means to position said support means on the marine structure so that the support means projects laterally from the marine structure; and

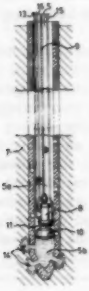
c. jack means connected between said support means and the annular hollow body for removing and replacing the annular hollow body and supported cylinder relative to the support means.

4,426,175

METHOD OF AND APPARATUS FOR REINFORCING PILING STRUCTURE AND IMPROVED PRECAST CONCRETE PILE SUITABLE FOR USE IN SAID METHOD

Juei-Tse Lin, No. 37-3, Szu Chuan Rd., Sec. 2, Pan Chiao City, Taipei Hsien, Taiwan

Filed Dec. 23, 1981, Ser. No. 333,688
Claims priority, application Japan, Jul. 3, 1981, 56-104795
Int. Cl.³ E02D *5/44*
U.S. Cl. 405—237 **7 Claims**



5. A hydraulic sealing apparatus, characterised by comprising a hydraulic cylinder in which is fitted a piston, a piston rod attached at one end to the piston and having a channel in its lower section, a fixed disc connected to a bottom end of the hydraulic cylinder through a plurality of connecting rods, a corresponding movable disc spaced from the fixed disc and fixed to a free end of the piston rod for concerted movement therewith, a supply line connected to the channel in the piston rod to allow passage of mortar into the hollow space of a precast concrete pile in which the apparatus is in use inserted, oil supply line means connected to the hydraulic cylinder for introducing oil into same to cause vertical movement of the piston, and a resilient rubber packing interposed between the fixed and movable discs so that when upward movement of the piston causes corresponding movement of the movable disc against the rubber packing, the rubber packing is compressed to swell radially to seal against a surrounding inner surface of the pile above said hollow space.

4,426,176

L-SHAPED CONCRETE BLOCK AND METHOD FOR CONSTRUCTING A RETAINING WALL BY SUCH L-SHAPED CONCRETE BLOCKS

Kinji Terada, Kitakyushu, Japan, assignor to Tokuyama Soda Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1981, Ser. No. 291,658
Int. Cl.³ E02D *29/02*
U.S. Cl. 405—285 **4 Claims**

1. Method for constructing a retaining wall by a plurality of L-shaped concrete blocks, comprising

(1) preparing a plurality of said L-shaped concrete blocks, said each L-shaped concrete block comprising

(i) a vertical front wall portion consisting of of a rectangular plate, said front wall being provided with at least one vertical elongated hole through which a reinforcing bar passes,

(ii) a vertical rear retaining portion extending rearwardly and perpendicularly from said front wall portion, said rear retaining portion having the proximal end thereof integrally connected to the rear surface of said front wall portion at a position approximately one fourth the distance from one side of said front wall portion, and

(iii) a vertical enlarged gnarl-like uniting portion integrally formed at the distal end of said rear retaining portion, said enlarged uniting portion being provided with a vertical elongated hole through which a reinforcing bar is adapted to pass,

(2) mounting a plurality of said reinforcing bars firmly and in a parallel spaced apart manner on a concrete foundation,

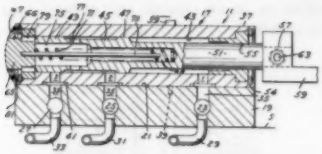
(3) arranging and stacking a plurality of rows of said L-shaped concrete blocks on said foundation by passing said reinforcing bars through said vertical elongated holes of said L-shaped concrete blocks, said stacking being in a staggered pattern while alternately reversing the sides of said front wall portions of said L-shaped concrete blocks row after row, thus defining a vertical square space between each two vertical rear retaining portions, and

(4) filling soil into said vertical square spaces and solidifying said soil after said filling.

4,426,177
AUTOMATIC FAULT DETECTION SYSTEM FOR A MACHINE TOOL

Louis J. Perry, Oak Park, Mich., assignor to Invo Spline, Inc., Warren, Mich.

Filed Aug. 31, 1981, Ser. No. 297,797
Int. Cl.³ B23B 47/24; B23G 1/00; G01L 19/06
U.S. Cl. 408—8 8 Claims



1. A fault detection system for use with a machine and operable through a cycle of operation upon receipt of a start check signal from the machine;

comprising a combination pneumatic-mechanical cylinder limit valve forming a sensor which includes a movable rod provided with a spool portion;

said sensor further including a power port and first and second pressure sensing ports;

means biasing said rod to an extended position into engagement with a target such as a tool or a workpiece, the presence of which is necessary for proper operation of the machine;

a control unit including a source of air under pressure;

first means operable upon supplying air under pressure to said control unit which then allows air to reach said first pressure sensing port and said power port to move said rod towards a retracted position;

said first pressure sensing port being normally vented to atmosphere but blocked by said spool portion and rod when said rod is fully retracted;

a first pressure sensing switch responsive to and actuated by a pressure build up at said first pressure sensing port when said rod is fully retracted;

second means connected to said first means and effective when energized by receipt of the start check signal after said first pressure sensing switch is actuated to shift said first means to thereby block the flow of air to said power port and to said first pressure sensing port, and successively supply air under pressure to said second pressure sensing port;

means venting said second pressure sensing port to atmosphere except when said rod is extended by its biasing means and thereby moved to a good check stroke position engaging the target and blocking said second pressure sensing port;

and a second pressure sensing switch responsive to and actuated by a build up of pressure at said second pressure sensing port due to said blockage to activate the machine for a cycle of operation.

4,426,178
PIPE CUTTING AND THREADING DEVICE

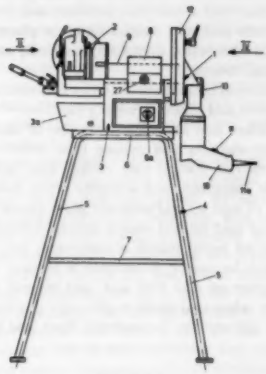
Xaver Wüchner, Jestetten, Fed. Rep. of Germany, assignor to George Fischer Ltd., Switzerland

PCT No. PCT/CH80/00158, § 371 Date Sep. 29, 1981, § 102(e) Date Sep. 29, 1981, PCT Pub. No. WO81/02267, PCT Pub. Date Aug. 20, 1981
PCT Filed Dec. 22, 1980, Ser. No. 308,534
Claims priority, application Switzerland, Feb. 13, 1980, 1166/80
Int. Cl.³ B23G 1/02, 1/24
U.S. Cl. 408—28 10 Claims

1. An apparatus for cutting and threading pipe, comprising a portable support frame formed by disengageable members;

a cutting unit mounted on said frame and having a first drive motor;

a threading unit having a second drive motor separate from said first drive motor and mounting means for coupling said threading unit to said frame for pivotal movement between operative and inoperative positions and for axial movement toward and away from said cutting unit during threading operations, said mounting means including a



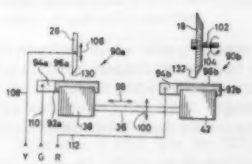
guide pipe on which said threading unit is slidably and rotatably mounted; and

pipe clamping means, mounted in a fixed axial position on said frame between said cutting unit and said threading unit, for non-rotatably holding pipe during cutting and threading operations, said pipe clamping means extending the entire distance between said cutting unit and said threading unit when said units are located in their closest relative axial positions.

4,426,179
TESTER FOR KEY DUPLICATING MACHINES

Robert C. Jefferson, 209 Park Ave., Emporia, Va. 23847

Filed Jun. 25, 1982, Ser. No. 392,239
Int. Cl.³ B23C 1/16; G01R 31/02
U.S. Cl. 409—82 14 Claims



1. A tester system for use with a key duplicating machine of the type having a rotary cutting tool for forming cuts and wards in a key blank when held in a first vise, a guide to follow the cuts and wards of a cut key when held in a second vise, a shoulder guide member to position the shoulders of said key blank and said cut key relative to said guide and said cutting tool and means for simultaneously bringing said cut key into contact with said guide and said key blank into contact with said cutting tool, wherein said system comprises:

a first detector plate for clamping in said first vise, said first detector plate being electrically insulated from said first vise and having a portion not electrically insulated from contact with said cutting tool;

a second detector plate for clamping in said second vise, said second detector plate being substantially identical in di-

mensions with said first detector plate and being electrically insulated from said second vise and having a portion not electrically insulated from contact with said guide;

an electrical power source having a first and a second electrical terminal;

a first electrical connection between said first terminal of said source and said first detector plate, said first electrical connection containing a serially interposed first signal means;

a second electrical connection between said first terminal of said source and said second detector plate, said second electrical connection containing a serially interposed second signal means;

a third electrical connection between said second terminal of said source and said duplicating machine;

whereby when said uninsulated portion of said first detecting plate contacts said cutting tool, whenever said first vise is moved toward said cutting tool said first signal means is energized, and whereby when said uninsulated portion of said second detector plate contacts said guide whenever said second vise is moved toward said guide, said second signal means is energized, and thereby said guide may be exactly positioned to achieve simultaneous energization of said first and said second signal means whereby when said guide is correctly positioned an exact copy of said cut key is produced from said key blank.

4,426,180

TRACER CONTROL SYSTEM

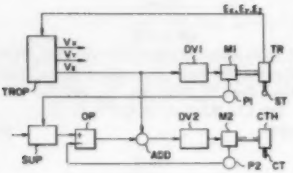
Ryoji Imazeki; Etsuo Yamazaki, and Hitoshi Matsuura, all of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Aug. 12, 1981, Ser. No. 292,274

Claims priority, application Japan, Aug. 27, 1980, 55-118134

Int. Cl.³ B23Q *35/14*

U.S. Cl. 409—99 **3 Claims**



1. A tracer control system which performs tracer control according to a tracer control signal based on a displacement signal from a tracer head tracing the surface of a model, said system comprising:

a first drive system for feeding said tracer head in the Z-axis direction;

a second drive system for feeding a cutter head in the Z-axis direction;

first and second position detectors for respectively detecting the positions of said tracer head and said cutter head in the Z-axis direction and for providing corresponding position signals;

a superimposing circuit for adding said position signal from said first position detector and an infeed command signal setting the infeed of said cutter head and for providing an output signal corresponding to the addition; and

means for forming the difference between the output signal from said superimposing circuit and the detected position signal from said second position detector and for supplying same to control said second drive system,

wherein desired infeed of the cutter can be provided by said infeed command signal, taking into account said position signal from said second position detector.

4,426,181

BINDER FOR PANELS

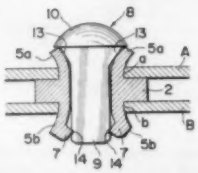
Nobuaki Omata, Hiroshima, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Nov. 27, 1981, Ser. No. 325,177

Claims priority, application Japan, Nov. 27, 1980, 55-168751[U]

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—33 **2 Claims**



1. A binder for panels, comprising a main binder part and a wedge member, said main binder part being formed of a tubular shaft, a flange of a prescribed thickness disposed on the peripheral surface substantially in the middle of the longitudinal extent of said tubular shaft, four slits inserted perpendicularly into the upper and lower shafts on the opposite sides of said flange inwardly from the outer ends of said upper and lower shafts with the directions of said slits coinciding on the opposite sides of said flange, said slits dividing the upper and lower shafts each into four split portions in a manner producing a phase difference of 90° on the opposite sides of said flange, and raised portions formed one each on the inner wall surfaces of one of the two pairs of opposed split pieces on the upper and lower sides of said flange, said selected pairs of opposed split portions involving said phase differences, and said wedge member being formed of a shank portion having a cross section of the shape of an oblong rectangle and a head portion integrally disposed at the upper end of said shank portion, with the opposite narrower surfaces of the shank portion diverged upwardly in the upper portion of said shank portion bordering on the lower side of said head portion, whereby said wedge member is opposed to either of the end faces of the upper and lower shafts of said main binder part and then passed through the cavity enclosed with the four split portions and pushed into the four split portions on the opposite side so that the narrower surfaces at the leading end of the shank push outwardly the raised portions formed on the inner wall surfaces of one of the pairs of opposed split portions and expand the pair of split portions and, at the same time, the diverged portion at the upper end of the shank portion forces its way into and consequently expands the other pair of opposed split portions containing no raised portion.

4,426,182

TUBULAR HANDLING APPARATUS

Robert Frias, Odessa, and Troy D. Cain, Fort Worth, both of Tex., assignors to Ingram Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 185,726, Sep. 10, 1980, Pat. No. 4,382,738, and Ser. No. 185,727, Sep. 10, 1980, abandoned. This application Sep. 10, 1981, Ser. No. 301,928

Int. Cl.³ E21B *19/14*

U.S. Cl. 414—22 **43 Claims**

1. An apparatus for transferring tubulars between the floor of a drilling rig and a pipe rack comprising,

an elongated main support frame adapted to be positioned in proximity to said pipe rack,

a lift trough positioned longitudinally of said support frame and having one end pivotally coupled to said main support frame, whereby said lift trough can be pivoted upwardly to an inclined position,

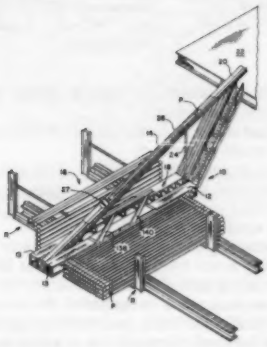
a power means connected to said lift trough for pivoting said

lift trough upwardly to an inclined position relative to said main support frame and toward said drilling rig and downwardly to a generally horizontal position,

a carriage means operatively connected to said lift trough for moving tubulars positioned in said lift trough along its length,

a driving means for driving said carriage means along said lift trough,

said driving means including an endless chain means drivingly connected to said carriage means, an endless drive chain associated with said endless chain means, an endless



drive chain driving means operatively connected to said endless drive chain means for driving said endless drive chain, and a transmitting means for transmitting drive from said endless drive chain to said endless chain means,

said lift trough including a tiltable dump trough,

a tilting means for tilting said dump trough laterally relative to said main support frame, and

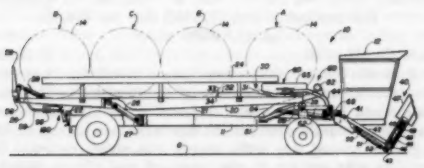
a releasable connecting means for connecting said carriage means to said driving means when said dump trough is in an untilted position relative to said lift trough, said releasable connecting means being in a disconnected position when said dump trough is in a tilted position.

4,426,183

AUTOMATIC CONTROL LINKAGE FOR ROUND BALE WAGON

L. Dennis Butler, Kingsburg, Calif., assignor to Sperry Corporation, New Holland, Pa.

Filed Jun. 23, 1981, Ser. No. 276,587
Int. Cl.³ A01D *90/00, 87/12*
U.S. Cl. 414—24.5 **13 Claims**



1. A bale wagon for picking up round bales of crop material from a field, accumulating a plurality of bales and transporting the accumulated bales to a preselected storage location to be unloaded from the bale wagon, comprising:

a mobile frame adapted for movement across the field;

a bale pickup means mounted on said frame for individually engaging bales of crop material on the ground and elevating said engaged bales;

a load bed supported on said frame for accumulating a plurality of said bales;

a load rack mounted on said load bed adjacent said bale pickup means for receiving bales of crop material elevated by said bale pickup means, said load rack having a receiving portion on which a number of bales may be positioned in a row;

cross conveyor means mounted on said frame for conveying bales received on said load rack from said bale pickup means along said receiving portion to form a row of said bales;

pusher advance means mounted on said frame adjacent said receiving portion of said load rack to advance said bales from said receiving portion onto said load bed after a row of bales has been formed by said cross conveyor means;

power means for operatively powering said bale pickup means, said cross conveyor means and said pusher advance means; and

control means operatively associated with said power means for sequentially controlling the operation of said cross conveyor means and said pusher advance means in a predetermined pattern of operation, said control means including a control linkage operatively interconnecting said bale pickup means, said cross conveyor means, said pusher advance means and said power means to effect a sequential controlling of the operation of said cross conveyor means and pusher advance means so that said cross conveyor means will form a row of said bales on said receiving portion of said load rack and cease operation until said pusher advance means has advanced said row of bales from said load rack onto said load bed in response to the operation of said bale pickup means in elevating said bales from the ground onto the receiving portion of said load rack, said power means including a first drive member for operatively powering said cross conveyor means and a second drive member for operatively powering said pusher advance means, said control means further including switching means operatively connected to both said first and second drive members to switch the actuation of said first and second drive members therebetween such that only one of said drive members can be operatively powered at a time, a first linkage assembly connected to said switching means and a second linkage assembly interconnecting said bale pickup means and said first linkage assembly, the operation of said bale pickup means to load bales onto said load rack effecting movement of said second linkage assembly which transfers movement to said first linkage assembly to effect operation of said switching means to switch actuation from one of said drive members to the other of said drive member.

4,426,184

BAG PALLETIZER

Ernest E. Boyland, North Little Rock, Ark., assignor to Quikstak, Inc., Little Rock, Ark.

Filed Dec. 4, 1981, Ser. No. 327,443
Int. Cl.³ B65G *57/10, 57/24*
U.S. Cl. 414—82 **23 Claims**

1. A bag palletizer comprising:

a support frame including a pallet magazine for maintaining a stack of pallets therein,

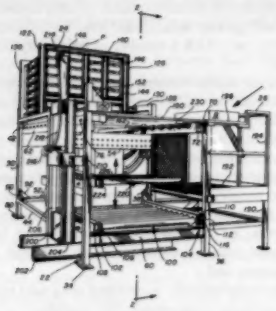
a loading plate mounted for reciprocating movement between a retracted position below the pallets in the pallet magazine to an extended position,

a vertically movable fork support movable between an upper position immediately below said loading plate when said loading plate is in its extended position and a lower position,

selectively actuating means associated with said loading plate for selectively engaging the lowermost pallet prior to movement of said plate to its extended position, and

sequencing means for moving said loading plate from its retracted position to its extended position, withdrawing

said lowermost pallet from said stack of pallets, retracting said plate to deposit said pallet on said fork support, low-



ering said fork support, extending said plate for receiving bags thereon and retracting said plate to load the bags on said pallet.

4,426,185

FEEDER FOR PARTICULATE MATERIAL

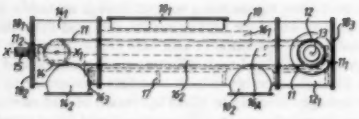
Eric Wheeler, and Gerald F. Arthur, both of Stroud, England, assignors to Redler Conveyors Limited, England

Filed Dec. 4, 1980, Ser. No. 212,853

Claims priority, application United Kingdom, Dec. 21, 1979, 7944290

Int. Cl.³ B65G *19/10*

U.S. Cl. 414—196 **13 Claims**



1. A feeder, comprising:

a substantially cylindrical vessel;

top and bottom troughs located in said vessel one above the other;

an en-mass conveyor associated with said troughs for conveying articles on said top trough in a first direction and articles on said bottom trough in a second direction;

an inlet formed in said vessel through which material to be conveyed can enter said vessel and land on said top trough wherein it is engaged by said conveyor and is moved in said first direction toward a first end of said trough;

said top and bottom troughs being juxtaposed such that material pushed off said first end of said top trough by said conveyor falls onto said bottom trough wherein it is engaged by said conveyor and moved in said second direction toward said first end of said bottom trough;

an outlet formed in said vessel through which material pushed off said first end of said bottom trough can exit said vessel; and

said troughs being spaced a sufficient distance from the walls of said vessel that material moved over said troughs by said conveyor do not come into contact with, and therefore do not abrade, said walls.

4,426,186

FORTUNE COOKIE MACHINE

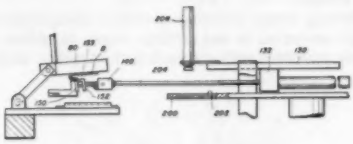
Yongsik Lee, 162 Winter St., Weston, Mass. 02193

Division of Ser. No. 141,371, Apr. 18, 1980, Pat. No. 4,339,993.

This application Jul. 6, 1982, Ser. No. 395,732

Int. Cl.³ B65H *9/00*

U.S. Cl. 414—225 **14 Claims**



1. A transfer mechanism for moving cookie blanks to a forming machine comprising:

a platform and an arm mounted on the platform and having gripping means at one end,

a scraper also mounted on the one end of the arm and operatively associated with the gripping means,

actuating means connected to the arm raising the arm to place the scraper in operative position,

additional actuating means connected to the arm for causing the gripping means to close about a cookie blank so that the arm can transport the blank,

and third actuating means connected to the arm to rotate it so as to transfer the blank to a forming machine and to turn over the blank carried by the gripping means.

14. A transfer mechanism adapted to move between an upper and lower griddle on which cookie blanks are baked and transport the blanks to a separate forming mechanism where the blanks are shaped, said blanks adhering to the top griddle when the griddle is opened; said transfer mechanism comprising:

an arm having a pair of grippers at one end,

means for opening and closing the grippers,

means mounting the arm for pivotal motion from a first position wherein the grippers are disposed between the open griddle and a second position wherein the gripper is disposed adjacent the forming mechanism,

actuating means connected to the arm for turning it about its center to invert a cookie blank held by its grippers,

and centering means actuated by the arm for positioning the cookie blank on the forming mechanism when the grippers release the blank in the second station.

4,426,187

DRIVE MECHANISM FOR A BOTTOM SILO UNLOADER

George E. Olson, Arlington Heights, Ill., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Division of Ser. No. 205,461, Nov. 10, 1980, Pat. No. 4,386,695.

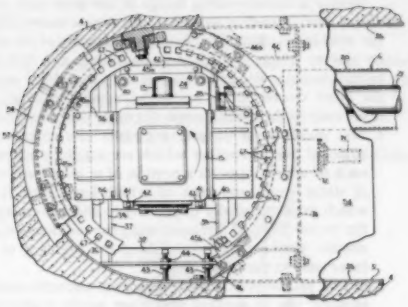
This application Sep. 27, 1982, Ser. No. 424,415

Int. Cl.³ B65G *65/46*

U.S. Cl. 414—310 **10 Claims**

1. A silo construction, comprising a foundation, a storage structure to contain stored material and mounted on the foundation and having a trough disposed in the foundation and extending from the center of the silo to the exterior and having a pair of spaced side walls, sweep arm means mounted for rotation with respect to the center of said silo to dislodge stored material and convey the dislodged material to said trough, a discharge conveyor mounted in the trough for conveying the dislodged material to the exterior of the structure, a vertical shaft disposed within the trough at the center of the silo, a lower gear box operably connecting the discharge conveyor and the shaft, whereby rotation of said discharge conveyor will cause rotation of said shaft, an upper gear box operably connecting the shaft and the sweep arm means whereby rotation of the shaft will rotate said sweep arm means

about its axis, a frame disposed within the trough, said lower gear box being secured to said frame, and adjusting means



connected to opposite sides of the frame and engageable with the side walls of said trough for adjustably mounting the frame and said lower gear box within said trough.

4,426,188

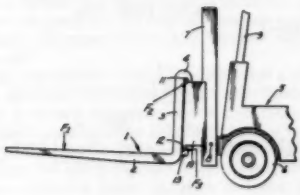
FORK CONSTRUCTION FOR FORK LIFT TRUCKS

Theodore L. Wolf, Southington; John A. Rossman, Mentor; Russell C. Quinn, Twinsburg, and Thomas J. Kish, Mentor, all of Ohio, assignors to Jos. Dyson & Sons, Inc., Eastlake, Ohio

Filed Mar. 23, 1978, Ser. No. 889,431

Int. Cl.³ B66F *9/14*

U.S. Cl. 414—667 **6 Claims**



1. A fork for a fork lift vehicle comprising a load arm, a support arm connected thereto and integral therewith, a head integral with the support arm to connect the fork to such vehicle, said head including a hook portion for interengagement with fork mounting means carried by said vehicle, said portion further comprising an integral, uninterrupted extension of the material of said arm, including the same material with grain flow therein following the contour of said head, through said hook portion, said fork being combined with a vehicle which includes a carriage thereon, said carriage including the mounting means, said mounting means comprising a transverse rail connected to the carriage and having a series of notches therein, the head being in engagement with the rail, and a latch member mounted in the head, said member having a portion in full engagement in one of said notches to prevent movement of the fork along said rail, a downwardly open groove is formed in the head at the rear thereof, said groove being engaged with the rail as stated, the notches are in the upper edge of the rail and extend at right angles across said rail, the latch member comprises a reciprocable member extending upwardly through the head, said member comprising an inverted generally L-shaped body pivoted at the juncture of the arms of said body, wherein the end of one arm may be moved into and out of engagement with a notch by manipulation of the other arm, a spring being positioned to exert pressure on said other arm to maintain the said end in engagement with said notch.

4,426,189

METHOD FOR ASSEMBLING CONSIGNMENTS

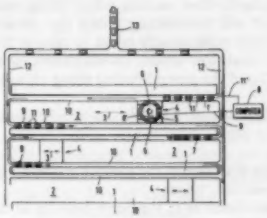
Otto Weber, Kurpfalzstrasse 21, D-6945 Hirschberg; Klaus Ohnsmann, Leharstrasse 32, D-6940 Weinheim, and Ferdinand Christ, Heidelbergerstrasse 7, D-6831 Brühl, all of Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,315

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036293

Int. Cl.³ B65G *1/02*

U.S. Cl. 414—786 **4 Claims**



1. A method for assembling consignments of articles stored in storage containers on a high shelf by means of a shelf consignment assembler having a working station and a controller for moving the assembler, adjusting the height of the assembly and transferring the buckets to a loading position, comprising the steps of moving said shelf consignment assembler including said working station along the aisle and adjusting the height of said working station depending on the articles to be unloaded or picked in accordance with the control of a computer being programmed with orders, said shelf consignment assembler picking from along said high shelf all the articles of a plurality of orders located on said high shelf while the controller of said assembler simultaneously moves said consignment assembler along said aisle and adjusts the height of said assembler, and transferring one of a plurality of collector buckets at a time to a loading position of said assembler in accordance with an order selectively under control of said computer and filling said collector bucket in accordance with the programmed orders as said articles from said high shelf are emptied, filling a corresponding number of consignment containers at the end of a trip of said assembler in said aisle in accordance with said programmed order.

4,426,190

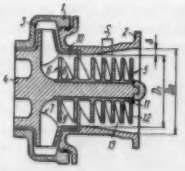
VANE PUMP

Anatoly S. Shapiro, Raketny bulvar, 12, kv. 7, Moscow; Leonid F. Kalashnikov, ulitsa 50 let VLKSM, 2, kv. 165, Kaliningrad Moskovskoi oblasti; Nikolai I. Leontiev, ulitsa Tereshkovoi, 6, kv. 27, Kaliningrad Moskovskoi oblasti; Vladimir I. Polyakov, ulitsa Ostrovskogo, 5, kv. 8, Kaliningrad Moskovskoi oblasti, and Anatoly A. Steblevsky, ulitsa Pionerskaya, 13, kv. 11, Schelkovo Moskovskoi oblasti, all of U.S.S.R.

Filed Dec. 11, 1980, Ser. No. 215,400

Int. Cl.³ F04D *3/02*

U.S. Cl. 415—74 **1 Claim**



1. A vane pump comprising a convergent housing which

accommodates an axial-flow suction wheel and a main axial-flow wheel installed in said housing, said suction wheel having a varying radial clearance with said housing, and said wheels mounted one after the other in the direction of flow on a common drive shaft, said suction wheel having a hub with helical vanes attached thereto that increase in pitch in the direction of flow, characterized in that the inside diameter of the pump in the inlet section of the axial-flow suction wheel has a diameter that decreases in the direction of flow from a maximum value to a minimum value at the inlet section of the main axial-flow wheel and equal to the inlet diameter of the main axial-flow wheel, the radial clearance between the housing and the axial-flow suction wheel being maximum at the inlet thereof and diminishing along the suction wheel to a minimum value substantially equal to zero at the inlet section of the main axial-flow wheel, the maximum value of the inside diameter (D_o) of the pump housing being chosen according to:

$$D_o = D_1 \cdot K_1 (C_k \cdot 10^{-4} + 2.1)^2,$$

where

D_o—inside diameter of the pump housing at the inlet section of the suction wheel;

D_1—inside diameter of the pump housing at the inlet section of the main axial-flow wheel;

K_1—dimensionless coefficient of 0.17 to 0.13

C_k—predetermined cavitation critical speed coefficient to 5,000 to 11,000;

and the setting angle (β_o) of the tip of the vane in the inlet section of the axial-flow suction wheel is minimal and determined according to:

$$\beta_o = (10 \div 33\Delta/D_1)^\circ + 1.50,$$

where

β_0—setting angle of the tip of the vane in the inlet section of the axial-flow suction wheel;

Δ—radial clearance in the inlet section of the axial-flow suction wheel;

D_1—inside diameter of the pump housing in the inlet section of the impeller wheel.

4,426,191

FLOW DIRECTING ASSEMBLY FOR A GAS TURBINE ENGINE

Robert F. Brodell, Guilford, Vt., and Roger J. Comeau, Ware, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 16, 1980, Ser. No. 150,514
Int. Cl.³ F01D 9/00
U.S. Cl. 415—189 **4 Claims**

1. For an axial flow gas turbine engine of the type having an annular flow path for hot working medium gases and a flow directing assembly including four or more arrays of stator vanes, an improved flow directing assembly which comprises:

an annular sleeve of circumferentially continuous material extending axially in the engine outwardly of the working medium flow path which is adapted to slidably engage an inner case having flanges, the annular sleeve having

an end having a large diameter,

an end having a small diameter,

a plurality of flanges spaced axially one from another extending circumferentially about the interior of the sleeve, each flange being radially outward of any flange on the inner case which is disposed entirely between said flanges on the sleeve and the small diameter end, and at least one of said flanges having a groove which faces the large diameter end and which is adapted to receive a corresponding flange of the inner case; and,

an inner case extending axially in the engine outwardly of the working medium flow path and inwardly of the annular sleeve, which is adapted to be moved as a unit with respect to outer sleeve during assembly to slidably engage the outer sleeve during assembly radially attaching the inner case to the outer sleeve, the inner case including

a first plurality of arcuate segments circumferentially adjacent one to another which are axially continuous, each of which supports a portion of at least two arrays of stator vanes and each of which has a first flange which extends radially outwardly to slidably engage in the circumferential direction said grooved flange on the annular sleeve radially attaching the segment of the inner case to the outer sleeve;

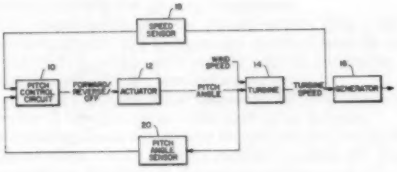
a second plurality of arcuate segments circumferentially adjacent one to another which are axially continuous, each of which supports a portion of at least two arrays of stator vanes, and each of which has a second flange extending outwardly into proximity with the annular sleeve, the second flange being integrally attached to the first flange of a corresponding segment of the first plurality of arcuate segments.

4,426,192

METHOD AND APPARATUS FOR CONTROLLING WINDMILL BLADE PITCH

Allan Chertok, Bedford; Joel Donahue, Woburn, and William Widnall, Lexington, all of Mass., assignors to U.S. Windpower, Inc., Burlington, Mass.

Filed Feb. 7, 1983, Ser. No. 464,726
Int. Cl.³ F03D 7/04
U.S. Cl. 416—1 **24 Claims**



1. A windmill control system for controlling a windmill that includes a turbine having turbine blades and a blade-pitch actuator for varying the pitch of the turbine blades in response to pitch-command signals applied thereto, said control system comprising:

A. a control output sensor for sensing a windmill control output and generating an output signal representative of the sensed control output; and

B. a control circuit for generating pitch-command signals, said control circuit being electrically connected to said blade-pitch actuator for transmission of the command signals to it, said control circuit further being electrically connected to said control-output sensor for reception of output signals therefrom and for deriving from the output signals a current control output and an average of the control output over a predetermined averaging interval, said control circuit sending command signals to said blade-pitch actuator to command pitch-angle changes in response to current and average control output, throughout at least a range of control outputs, only if the current control output is outside a predetermined wide deadband or the average control output is outside a predetermined narrow deadband included within the wide deadband, said control system thereby responding promptly to control-output excursions outside the wide deadband but acting to

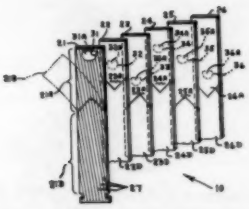
bring the control output within the narrow deadband only when the average control output falls outside the narrow deadband.

4,426,193

IMPACT COMPOSITE BLADE

Robert G. Carlson, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 22, 1981, Ser. No. 227,319
Int. Cl.³ F01D *5/28*
U.S. Cl. 416—229 A **1 Claim**



1. A composite blade for use in a fluid flow machine, wherein said blade has a tip portion, a root portion, a pressure surface, and a suction surface, and wherein said blade comprises a plurality of substantially parallel filament laminates bonded together, with each said laminate including:

a. a root portion matrix in which are embedded a plurality of boron filaments, with said root portion matrix comprising an aluminum alloy foil sheet disposed toward said blade pressure surface, and an essentially unalloyed aluminum foil sheet disposed toward said blade suction surface, with said boron filaments sandwiched between said two foil sheets; and

b. a tip portion matrix in which are embedded a plurality of boron filaments discontinued by a cavity having a resin therein, with said tip portion matrix comprising an essentially unalloyed aluminum foil sheet disposed toward said blade pressure surface, and another essentially unalloyed aluminum foil sheet disposed toward said blade suction surface, with said boron filaments and said resin-filled cavity sandwiched between these two foil sheets; and

wherein said root portion matrix and said tip portion matrix are bonded together at a common interface;

and wherein said tip portion with said resin-filled cavity, and said root portion without a resin-filled cavity, have different impact absorption capabilities;

and also wherein different areas of said tip portion, because of said resin-filled cavity, have different impact absorption capabilities.

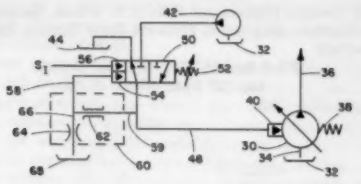
4,426,194

VISCOSITY COMPENSATING CIRCUITS

Frederic W. Pollman, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 6, 1981, Ser. No. 241,160
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—218 **17 Claims**

1. A viscosity compensating control circuit for a variable displacement pump and including a source of fluid flow, a first line including a control element which is pressure sensitive to flow and which upon an increase in pressure applied thereto decreases the displacement of said pump, a second line in parallel flow relationship to said first line and including a capillary and a flow restriction means in series flow relationship, a branch line connected to said second line between said capillary and said flow restriction means, said first and second lines being connected to said source of fluid flow by a pilot operated valve to control flow from said source to said first and second lines, said branch line includes a pilot for controlling the position of said valve to moduate flow to said control element and through said capillary to said branch line and said flow restriction means which are in parallel relationship, the pressure upstream of said flow restriction means and said control element determining the amount of flow across said capillary, and the pressure drop across said capillary raises the pressure at said control element to compensate for increases in viscosity of the fluid which decreases the displacement of said pump to reduce the fluid flow of said pump.

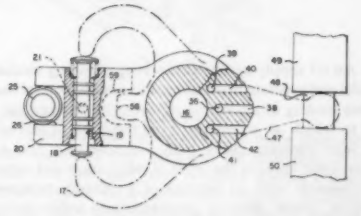


4,426,195

ADJUSTABLE AXIAL FLOW PISTON MACHINES

Karl Herbert, Laudenbach, and Gustav Kleineisel, Mainaschaff, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

Filed Aug. 26, 1981, Ser. No. 296,318
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 3034856
Int. Cl.³ F04B *1/26;* **F16D** *31/02;* **F15B** *9/10;* **F01B** *3/02*
U.S. Cl. 417—222 **12 Claims**



1. In an adjustable axial flow piston pump bearing a housing, a swivellable component in said housing, pressure medium loaded operating pressure chambers in said housing for swivelling the swivellable component, said chambers being capable of being loaded through a follow-up control arrangement having first and second control levers movable relatively to one another and supported on a common swivel axis with said swivellable component, said second control lever supported in a swivellable manner coaxially to the swivellable component, opposed control arms on one end of said second lever in operating connection with opposite ends of a final control valve means of the pressure medium-loaded pressure chambers, said final control valve means being supported in said first control lever that is swivellable in common with the swivellable component and with the final control valve means forming an edge control of the follow-up control arrangement, the improvement comprising said first lever connected with the swivellable component and supported in a section of the housing, said final control valve means mounted in and movable in said first lever, fluid passage means in said first lever supplying fluid pressure medium to the final control valve means, fluid passage means in said housing connected to said pressure medium loaded operating chambers and fluid passages means in said first lever connecting said final control valve means and the fluid pas-

sages in said housing whereby fluid pressure medium is delivered through the first lever and final control valve means to at least one of said pressure medium loaded operating chambers.

4,426,196

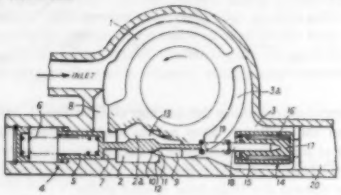
OIL SUPPLY SYSTEM

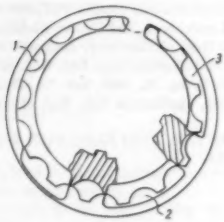
Ian T. Bristow, Higham, and Peter A. E. Wilson, Snodland, both of England, assignors to Hobourn-Eaton Limited, Rochester, England

Filed Sep. 16, 1981, Ser. No. 302,520

Int. Cl.³ F04B *49/08, 49/10*

U.S. Cl. 417—282 **6 Claims**





1. An oil supply system comprising pumping means having an inlet and separate first and second outlets, at least one of said outlets leading to a point of utilization of pumped oil, a reservoir to which oil is returned from the point of utilization, the said inlet communicating with said reservoir, and a spring-loaded relief valve in the other of said outlets and which opens progressively with an increase of a delivery pressure of the pumping means above a predetermined value to by-pass a proportion of the delivery of the pumping means to the inlet side of the pumping means, a temperature responsive element responsive to a temperature of the oil delivered by the pumping means through said one outlet and connected to superimpose a load on the relief valve in a sense to increase the opening of the relief valve with an increase of said temperature, and a variable restrictor controlled in accordance with the control of the relief valve which restrictor interconnects said outlets.

4,426,197

APPARATUS FOR THE CONVERSION OF POWER STROKES OF A RANDOM SEQUENCE AND OF RANDOM LENGTHS OF STROKES INTO POTENTIAL ENERGY

Erwin Elkuch, Toni-Aeule-Strasse 10, FL-9490 Vaduz, Liechtenstein

Filed Sep. 3, 1981, Ser. No. 299,017

Claims priority, application Switzerland, Sep. 30, 1980, 7308/80

Int. Cl.³ F04B *9/10*

U.S. Cl. 417—331 **4 Claims**

1. An apparatus for the conversion of the power strokes of ocean waves appearing at a random sequence and having random lengths of strokes into potential energy, comprising

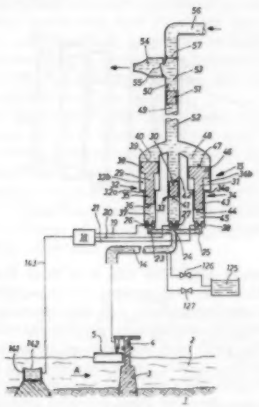
an upright supporting means firmly anchored in the sea bed,

a plurality of float means guided for vertical movement along and by said supporting means,

a plurality of piston-cylinder means of which at least one each is mounted on one said float means,

at least one pump means provided with at least two pistons having a top and a bottom piston surface of which at least one piston is provided with a top piston surface of a greater surface area then its bottom piston surface,

a fluid filled conduit means extending between each said piston-cylinder means and said at least one pump means communicating said piston-cylinder means with said bottom piston surfaces,



a working fluid circuit,

a further conduit means extending from said top piston surfaces to said working fluid circuit, which further conduit means opens at a point intermediate two working fluid circuit check valves into said working fluid circuit such that in operation of said pump means a predetermined direction of flow of a working fluid contained in said working fluid circuit is secured, and

a storage vessel for storing the working fluid pumped by said pump means thus storing its potential energy.

4,426,198

FUEL-INJECTION PUMP FOR INTERNAL COMBUSTION ENGINE

Dirk Bastenhof, Eaubonne; Roger Brisson, Gonesse, and Claude Bonniot, Paris, all of France, assignors to Societe d'Etudes de Thermiques S.E.M.T., St. Denis, France

Continuation of Ser. No. 152,537, May 23, 1980, abandoned. This application Mar. 25, 1983, Ser. No. 477,594

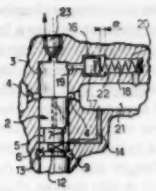
Claims priority, application France, May 28, 1979, 7913486; May 16, 1980, 8011046

Int. Cl.³ F02M *59/38*

U.S. Cl. 417—494 **6 Claims**

1. An injection pump for injecting fuel into a cylinder of an internal combustion engine, the pump comprising a fuel receiving chamber defined within a cylindrical body, a plunger slidably disposed within an inside space of said body for reciprocating linear motion between a bottom dead center position and a top dead center position, said chamber being provided with fuel inlet ports connected to a fuel supply source at a relatively low pressure and which are adapted to be covered by said plunger during its displacement towards its top dead center to cause fuel to be discharged out of said chamber towards the injector associated with said engine cylinder, said plunger having a head formed with at least one helical ramp on its periphery and a passageway opening into said chamber and adapted to communicate with at least one duct connected to

said fuel supply source and opening into the inside space of said body in which said plunger is disposed, for interrupting the fuel discharge out of said chamber towards said injector during the displacement of said plunger towards its top dead center, such that the fuel discharge is separated into a first discharge phase providing a pre-injection of fuel into said engine cylinder and a second phase providing a main fuel injection, wherein the injection pump further comprises an accumulator device including an accumulating chamber which communicates permanently with said fuel receiving chamber and has a volume variable by a piston fitted into said accumulating chamber and movable against a return spring under the action of the pressure in the fuel receiving chamber, the stroke of said piston being limited by a stop forming a fluid-tight seat, said piston being moved against said seat by pressure developed during the first discharge phase and retained on its seat during discharge interruption under the effect of a pressure in the receiving chamber produced during said discharge interruption by said plunger continuing its displacement towards its top dead center, whereby the start of the pre-injection is delayed without affecting the start of the main fuel injection.



4,426,199

ROTARY FLUID ACTUATED MACHINE

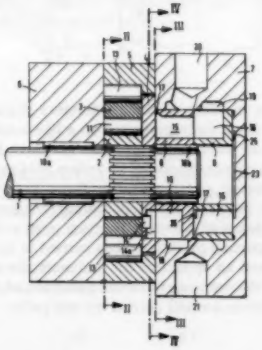
Peter Wüsthof, and Johann Schneider, both of Lohr, Fed. Rep. of Germany, assignors to Mannesmann Rexroth, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,458

Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119807

Int. Cl.³ F01C *1/113*

U.S. Cl. 418—61 B **5 Claims**



1. A fluid pressure-operated rotating machine comprising:

a cup-shaped housing body having a cylindrical inner surface with means defining first and second axially spaced annular channels in said inner surface;

first and second disc-shaped stationary commutator members mounted in said housing in radial alignment with said first and second channels, respectively

each of said commutator members having a plurality of uniformly circularly spaced channels therein, alternate ones of said channels being axial through-passages and the intervening channels being corner channels opening axially to one face of the member and radially,

said members being circularly aligned so that a corner channel in one member is axially aligned with a through-passage in the other and radially aligned with an annular channel;

a control plate having a plurality of axial passages therethrough smaller in number than the channels in said commutator members, said control plate being coaxial with said members and adjacent a face of one of said members;

means for supplying fluid under pressure to one of said annular channels and receiving fluid from the other; and

means defining a variable-volume, rotatable chamber coupled to rotate with said plate to receive fluid under pressure from said one annular channel through selected pairs of said channels in said commutator members, to be rotatably driven thereby and to return fluid to the other of said annular channels.

4,426,200

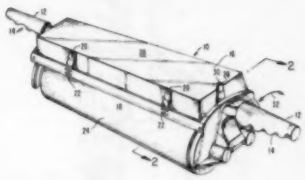
ROLLING PIN APPARATUS

Sylvie Muller, 21 Brookdale Rd., Glen Cove, N.Y. 11542

Filed Sep. 27, 1982, Ser. No. 423,670

Int. Cl.³ A21C *3/02*; B29C *15/00*; B29D *7/14*

U.S. Cl. 425—101 **13 Claims**



1. A rolling pin apparatus comprising:

a pair of cylinders, said pair of cylinders being disposed in parallel alignment and journaled for independent free rotation to a structure, said structure having a hollow chamber disposed therewithin, said structure including a valve, said valve communicating to an interior portion of said chamber and to at least portions of each of said pair of cylinders when said valve is in an opened condition, a pair of handles, said pair of handles being fixedly secured to said structure and each being disposed substantially coaxially aligned, means to scrape portions of the surfaces of said pair of cylinders when said pair of cylinders are being caused to rotate about their longitudinal axes in any direction.

4,426,201

SCREW FEED/RAM INJECTOR

Zachariha Cohen, c/o U.S. Molding Machinery Company, 21200 St. Clair Ave., Cleveland, Ohio 44117

Filed Sep. 3, 1981, Ser. No. 299,166

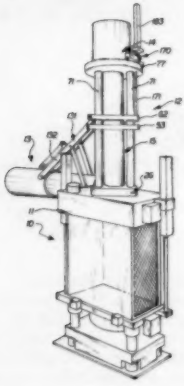
Int. Cl.³ B29F *1/08*

U.S. Cl. 425—147 **24 Claims**

1. In a compression molding or like type machine having a machine frame including a plate member associated with one of two platens of the machine, a retrofitted ram injector unit fixed on the machine frame plate member and including a piston and cylinder ram drive assembly and a piston and cylinder injector assembly operated by the drive assembly, the injector assembly including mounting block means removably secured to said plate member in a manner capable of exclusively supporting said injector unit on said plate member, a screw feeder unit for charging molding compound into the

injector cylinder, mounting means for removably supporting said screw feeder unit on said injector cylinder assembly rigidly on said mounting block means, said mounting means being constructed and arranged in such a manner as to be capable of providing the sole support for said screw feeder unit free of significant direct structural interconnection with said frame.

19. A screw feeder for a molding press, including an elongated barrel formed by a cylindrical sidewall having an internal cylindrical bore and a central axis, said barrel having an outlet adjacent a forward end thereof communicating with said barrel bore, said barrel having an inlet passage through said sidewall remote from said outlet for admitting molding compound into the barrel, a feed screw disposed in the barrel for rotation about said barrel axis, said screw having a major diameter closely fitting said bore, means for rotating the screw on the barrel axis, a temperature-control block circumferentially surrounding and in thermal communication with said barrel in an axial zone including said inlet and limited in length to substantially less than the distance between said inlet and outlet, said block having serially connected internal flow paths for conducting temperature-controlling fluid in a serpentine path forwardly parallel to the axis of the barrel, circumferentially of the barrel, and rearwardly parallel to the axis of the barrel within said block, said flow paths including a multiplicity of both forward and rearward courses along the barrel.



23. In a ram injector unit for a molding press, said injector unit including a storage chamber for molding compound, an outlet nozzle for said storage chamber, said outlet nozzle having a central aperture for discharge of molding compound, said nozzle including a pair of concentric sleeve elements, one of said elements having multiple helical grooves formed on a surface thereof in contact with and closed by a corresponding surface of the other element, one of the grooves being connected to an inlet at one end of the elements, means for communicating fluid from said one groove to another at the opposite end of said elements, the other groove being connected to an outlet at said one end of said elements.

24. In a molding press, a storage chamber for molding compound, said storage chamber having an outlet adapted to be connected to a mold cavity, a plunger for forcibly driving the molding compound from the storage chamber, the plunger having a face adapted to directly contact molding compound in the storage chamber, a screw feeder having an outlet communicating with said storage chamber to forcibly drive molding compound into said storage chamber, said screw feeder including a screw and a rotary motor driving said screw in rotation, said chamber being arranged to permit molding compound entering said storage chamber to drive said plunger rearwardly to expand the effective volume of said storage chamber, sensor means measuring the position of said plunger in said storage chamber, and therefore the effective volume of molding compound in said storage chamber, said sensor means including an elongate element having a length at least as long as the stroke of said plunger, said elongate element having an end affixed relative to said plunger, and measuring means mechanically interengaged with said elongate element and fixed relative to said storage chamber, the interengagement of said measuring means with said elongate element permitting said measuring means to measure displacement of said elongate element with said plunger and thereby determine the amount of molding compound in said storage chamber for interruption of operation of said rotary motor, said elongate element being laterally supported by spaced guide means fixed relative to said storage chamber, said measuring means engaging said elongate element at a zone intermediate said spaced guide means.

4,426,202

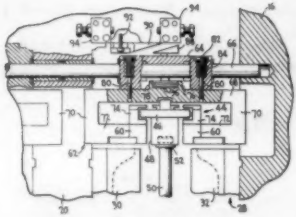
PALLET LOAD SUPPORT

Suppayan M. Krishnakumar, Nashua, N.H.; John F. E. Pocock, Stone Mountain, Ga., and Ieuan L. Harry, Nashua, N.H., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Apr. 2, 1982, Ser. No. 364,698

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—534 **15 Claims**



1. In a blow molding machine wherein a plurality of preforms are simultaneously presented to a like number of split blow molds, and wherein the preforms are carried by a pallet movable along a track supported by rollers, said pallet forming means for retaining and carrying preforms to, while in, and from said blow molds without separation of the preforms from said pallet in terms of carrying function, said pallet forming means for supporting preforms when carried to and from said blow molds, and an apparatus for automatically transferring the support of the preforms from said pallet to said blow molds while the preforms are still carried by said pallet.

4,426,203

STABLE ANHYDROUS TEXTILE ASSISTANT

Heinz Abel, and Josef Oxe, both of Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,939
Claims priority, application Switzerland, Jan. 6, 1981, 32/81
Int. Cl.³ D06L 3/02, 1/14
U.S. Cl. 8—138 29 Claims

1. A stable anhydrous textile assistant which comprises at least (A) an anionic surfactant of the formula

$$R—O—(CH_2CH_2O)_mX$$

wherein R is alkyl or alkenyl of 8 to 22 carbon atoms, o-phenylphenyl or alkylphenyl containing 4 to 16 carbon atoms in the alkyl moiety, X is a phosphoric acid radical, and m is 2 to 30; (B) an inorganic oxidizing agent, and (C) a siloxane-oxyalkylene copolymer.

4,426,204

PROCESS FOR THE MARKING OF CARRIERLESS POLYMERIC MEMBRANES AND ASYMMETRIC CARRIERLESS POLYMERIC MEMBRANE

Nils Hese; Alfred Seeling, both of Einbeck, and Manfred Weisweiler, Garlebsen, all of Fed. Rep. of Germany, assignors to Carl Schleicher & Schull GmbH & Co. KG, Einbeck, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,121
Int. Cl.³ D06P 7/00; C04B 41/16
U.S. Cl. 8—492 8 Claims

1. A process for the marking of carrierless polymeric layers in which a casting mass containing an organic solvent and serving for the production of the layer is poured onto a support carrying marking symbols imprinted thereon by means of a printing ink and in which after solidification of the layer, the latter is removed from the support while taking the printing ink along with it, the improvement of said process wherein the printing ink is dried in a wipe-proof manner on a smooth surface of the support at the time the layer casting mass is poured onto the smooth surface of the support, and the layer is a carrierless polymeric membrane for filtration purposes and for reverse osmosis and the support-side of the layer casting mass is the inactive side of the layer.

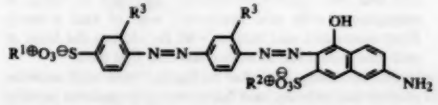
4,426,205

NOVEL RED DYES FOR FIBERGLASS AND PAPER

Robert F. Bann, and John E. Innes, both of Marietta, Ohio, assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 20, 1982, Ser. No. 451,697
Int. Cl.³ D06P 3/80
U.S. Cl. 8—523 10 Claims

1. A red dye composition comprising the dye compound



wherein $R^{1\oplus}$ and $R^{2\oplus}$ are alkali metal cations or ammonium ions of a lower alkylol amine, and R_3 is hydrogen or lower alkyl, and at least one rhodamine dye.

4,426,206

TEXTILE PRINTING PASTE COMPOSITION WITH HIGHLY SUBSTITUTED CARBOXYMETHYL CELLULOSE

Teijiro Hosokawa; Shigetoshi Kako, and Kazuyuki Hagino, all of Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 347,126, Feb. 9, 1982. This application Jun. 9, 1983, Ser. No. 502,847
Claims priority, application Japan, Mar. 9, 1981, 56-034357
Int. Cl.³ C09D 17/00; D06P 1/50
U.S. Cl. 8—528 7 Claims

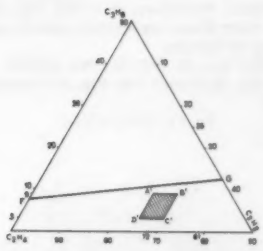
1. A textile printing paste composition comprising an alkali metal salt of carboxymethylcellulose having an average degree of substitution of at least 2.2 per glucose unit, the aqueous solution of said salt in the concentration of 2% on the anhydrous basis having a viscosity of 10 to 10,000 cps as measured in a B-type rotational viscometer at 20 rpm at 25° C.

4,426,207

STABLE TERNARY CRYOGENIC FUEL HAVING DENSITY IN THE GASEOUS STATE LESS THAN THAT OF AIR

Maurice Bruni, Tremblay-les-Gonesse, and George Duboz, Paris, both of France, assignors to L'Air Liquide-Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Mar. 1, 1982, Ser. No. 353,209
Int. Cl.³ C10L 1/00
U.S. Cl. 44—50 8 Claims



1. Stable cryogenic ternary fuel having a density in the gaseous state less than that of air, consisting of a mixture of acetylene, ethylene and a hydrocarbon containing three carbon atoms in its molecule, wherein said initial cryogenic mixture contains 25 to 30% by volume of acetylene, 61 to 72% by volume of ethylene and 3 to 9% by volume of the C_3 hydrocarbon.

4,426,208

CORROSION INHIBITORS FOR ALCOHOL-BASED FUELS

Warren L. Perilstein, Orchard Lake, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 2, 1981, Ser. No. 317,568
Int. Cl.³ C10L 1/18
U.S. Cl. 44—56 26 Claims

1. A liquid fuel for use in spark ignited internal combustion engines comprising a major amount of hydrocarbons boiling in the gasoline boiling range, a minor amount of ethanol and a corrosion inhibiting amount of a mixture of (a) from about 5 to 95 parts of at least one polymerized unsaturated aliphatic monocarboxylic acid having from about 16 to 18 carbon atoms per molecule, and (b) from about 95 to 5 parts of an aliphatic dicarboxylic acid selected from the group consisting of oxalic and sebacic acids.

4,426,209

CARBIDE COATED COMPOSITE MODIFIED SILICON ALUMINUM OXYNITRIDE CUTTING TOOLS

Vinod K. Sarin, Lexington, and Sergej-Tomislav Buljan, Acton, both of Mass., assignors to GTE Laboratories, Waltham, Mass.

Filed May 20, 1982, Ser. No. 380,387
Int. Cl.³ B24D *11/00*
U.S. Cl. 51—295 14 Claims

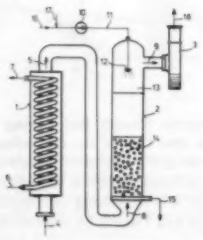
1. A coated abrasion resistant composite ceramic cutting tool comprising a substrate body and at least one adherent refractory metal carbide coating layer; said substrate body consisting essentially of a particulate material selected from the group consisting of the refractory metal carbides, nitrides, carbonitrides and mixtures thereof uniformly distributed in a matrix comprising a modified silicon aluminum oxynitride, said particulate material comprising from about 5 volume percent to about 60 volume percent of said cutting tool and having an average particle size of between about 0.5 microns and about 20 microns; said modified silicon aluminum oxynitride having a modifier selected from the group consisting of the oxides of silicon, ytrrium, magnesium, hafnium, zirconium, beryllium, the lanthanides and combinations thereof.

4,426,210

PROCESS FOR ELIMINATING ODOR-EMITTING SUBSTANCES FROM WASTE AIR

Friedrich Drawert, Freising; Peter Schreier, Würzburg, and Gabriele Krämer, Nuremberg, all of Fed. Rep. of Germany, assignors to Anton Steinecker Maschinenfabrik GmbH, Freising, Fed. Rep. of Germany

Filed Apr. 15, 1981, Ser. No. 254,490
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015220
Int. Cl.³ B01D *47/14*
U.S. Cl. 55—73 5 Claims



1. In a process for eliminating odour-emitting substances from the waste air of an industrial process including an apolar odour-emitting substance or a polar odour-emitting substance and wherein the waste air is purified by spraying in washing water, the improvement comprising adding to said washing water prior to spraying at least one compound of the following groups:

(a) partial esters of polyalcohols; ethylene oxide adducts and propylene oxide adducts with fatty acids, fatty alcohols, fatty amines, or partial fatty acids of polyhydric alcohols;

(b) long-chain substituted amino acids; or betaines; and

(c) mixtures of the compounds of groups (a) and (b),

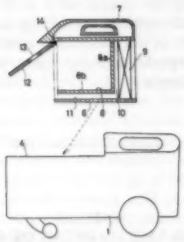
the said at least one compound of group (a) being used for eliminating apolar odour-emitting substances, and the said at least one compound of group (b) being used for eliminating polar odour-emitting substances, and spraying the waste air with said washing water containing said at least one compound.

4,426,211

VACUUM CLEANER WITH DUST DISPOSAL

Yasukazu Ataka, Ibaraki; Katuzi Ikezaki, Sakai, and Katsuhiko Umeda, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 16, 1981, Ser. No. 331,330
Claims priority, application Japan, Dec. 19, 1980, 55-184359[U]; Jan. 9, 1981, 56-2478[U]; Jan. 20, 1981, 56-7110[U]; Jan. 20, 1981, 56-7111[U]
Int. Cl.³ B01D *46/12*
U.S. Cl. 55—296 9 Claims



1. A detachable dust collector for use with a vacuum cleaner having a main body including an inlet opening and an outlet opening with an electric fan being operatively positioned therebetween, said dust collector comprising:

a housing having a top, bottom and two side walls adapted to be removably disposed within said main body and operatively positioned between said inlet opening and said electric fan;

primary filter means for trapping dust and objects of a predetermined size being operatively positioned within said housing;

said primary filter means including a horizontal wall extending from one side wall to the other side wall and a vertical wall being spaced from said bottom wall of said housing and extending from said top wall to said horizontal wall to define a dust collection chamber adapted to be in communication with said inlet opening and a first path being positioned between said horizontal wall of said primary filter means, said two side walls and said bottom wall of said housing;

secondary filter means for trapping dust and objects of a predetermined size being operatively positioned within said housing downstream of said primary filter means, said secondary filter means being spaced from said vertical wall to define a second path being in communication with said first path;

said secondary filter means extending between said top, bottom and both side walls of said housing to form an air permeable end closure for said housing; and

a movable lid being operatively positioned on an open front of said housing and being hinged about said top wall for forming a closure thereto, said lid including an opening adapted to be in communication with said inlet opening and said dust collection chamber and said lid being in engagement with said horizontal wall of said primary filter means and said bottom wall for closing the front of said dust collection chamber and said first path;

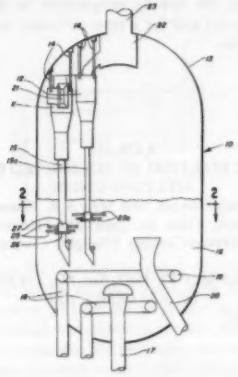
wherein detaching said dust collecto. from said vacuum cleaner and moving said lid to an open position permits dust and objects to be discharged in a single tilting action from said dust collection chamber of said primary filter means and from said first and second paths being in communication with said secondary filter means.

4,426,212

BRACING ASSEMBLY FOR CYCLONE DIPLEGS IN FLUIDIZED BED UNITS

Harold D. Zacher, Hammond, Ind., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 25, 1982, Ser. No. 411,545
Int. Cl.³ B01D 45/12
U.S. Cl. 55—345 5 Claims



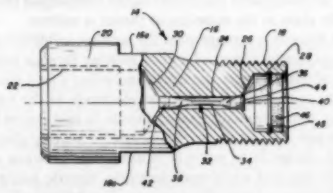
1. A dipleg bracing assembly comprising a pair of brace elements for each of a plurality of diplegs arranged in a regular polygonal pattern, each of the brace elements being rigidly connected at one end to a sleeve element surrounding one of said diplegs in rotatable relationship therewith and being pivotally connected to an encircling ring element rotatably supported on an adjacent dipleg whereby each of the ring elements is pivotally connected to two brace elements extending from adjacent diplegs, the rigidly connected ends of the brace elements serving to maintain the angular relationship of the diplegs to each other and the rotatable ring elements which are pivotally connected to the brace elements permitting thermal expansion and contraction of the brace elements without altering the distances between the diplegs or imposing thermal stresses upon the diplegs.

4,426,213

CONDENSATE REMOVAL DEVICE FOR STEAM LINES AND THE LIKE

Constantine N. Stavropoulos, Addison, Ill., assignor to Engineering Resources, Inc., Chicago, Ill.

Continuation of Ser. No. 207,802, Nov. 17, 1980, abandoned.
This application Apr. 9, 1982, Ser. No. 366,787
Int. Cl.³ B01D 46/10; F15D 1/02
U.S. Cl. 55—466 2 Claims



1. In a device for drainage of condensate from steam systems without passage of live steam, the improvement wherein said device comprises:

a. a body structure having a fluid flow conduit therethrough and including a generally cylindrical bore formed entirely within said body structure;

b. a first tubular nozzle frictionally mounted within said bore, said first nozzle having an internal constricted passageway therethrough communicating with said conduit, said first nozzle being interchangeable with at least a second tubular nozzle having external configuration likewise for frictional mounting within said bore, said second nozzle having an internal constricted passageway which is selected to be different in configuration than that of said first nozzle in order to enable variation in the constricted passageways suitable for operation with different steam pressures and different condensate drainage in said steam systems;

c. said conduit including a conical formation within said body structure, said conical formation opening outwardly from an entrance to said bore;

d. said first tubular nozzle including a terminal flange engaging said conical formation; and

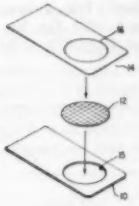
e. said first nozzle including at least first, second, and third generally coaxial and cylindrical constrictions formed within said passageway, the second of said constrictions having a somewhat larger diameter than the diameter of said first constriction and said third constriction having a diameter somewhat larger than the diameters of said first and second constrictions, said second constriction communicating with said first constriction through a first truncated conical bore joined therebetween, said third constriction communicated with said second constriction through a second truncated conical bore joined therebetween, so that the axial alignment of said first, second and third constrictions is in sequential order of increasing relative diameter.

4,426,214

LAMINATED FILTERS

George Vandrish, Vanier, Canada, assignor to Pylon Electronic Development Company Ltd., Ontario, Canada

Filed Mar. 3, 1982, Ser. No. 354,400
Claims priority, application Canada, Mar. 26, 1981, 373979
Int. Cl.³ B01D 46/10
U.S. Cl. 55—511 3 Claims

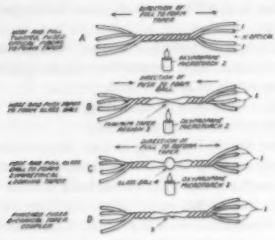


1. A filter for use in sampling devices for detecting particulate contaminants in a gaseous medium, comprising a base layer of opaque plastic material, said base layer having a hole of predetermined size; a filter membrane having a size slightly greater than said predetermined size and covering said hole; and a cover layer of plastic material covering said filter membrane and being adhered to said base layer, said cover layer having a hole of said predetermined size in registry with the hole in the base layer.

4,426,215
METHOD OF FABRICATING A LOW LOSS FUSED BICONICAL TAPER FIBER OPTIC COUPLER

Kent A. Murphy, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 309,360, Oct. 7, 1981, abandoned. This application Apr. 12, 1983, Ser. No. 484,343
Int. Cl.³ C03B *37/075, 37/14*
U.S. Cl. 65—4.21 **6 Claims**



1. A method of fabricating a low loss fused biconical taper fiber optic coupler comprising the steps of:

simultaneously heating and pulling N optical fibers to provide a minimum biconical taper region wherein said fibers are fused, where N is an integer greater than one; and

deforming cores of said N fibers at said minimum taper region, said step of deforming including a pushing step at said minimum taper region.

5. A method of fabricating a low loss fused biconical taper fiber optic coupler comprising the steps of:

simultaneously heating and pulling N optical fibers to provide a minimum biconical taper region wherein said fibers are fused, where n is an integer greater than one; and

deforming cores of said N fibers at said minimum taper region, said step of deforming including the steps of:

scoring said minimum region,

pulling said scored minimum region for separation thereof,

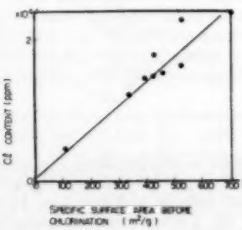
heating said separated minimum region, and

pushing said heated separated minimum region together to rejoin said separated minimum region.

4,426,216
PROCESS FOR PRODUCING OPTICAL GLASS

Shin Satoh, Iruma; Kenzo Susa, Tokyo; Iwao Matsuyama, Sagamihara, and Tsuneo Suganuma, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 1982, Ser. No. 337,451
Int. Cl.³ C03B *19/06*
U.S. Cl. 65—18.1 **14 Claims**



1. A process for producing optical glass which comprises:

(i) a step of partly sintering a porous hydrolyzed alkoxide gel by heating said gel to a high temperature and for a time sufficient such that said gel is partly sintered until the specific surface area of said gel becomes 30 to 100 m^2/g,

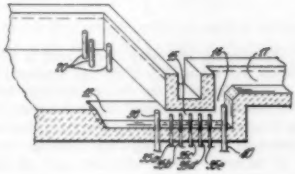
(ii) a step of subjecting the partly sintered gel to a hydroxyl group removal treatment by heating it in a chlorine-containing atmosphere to a temperature lower than the heating temperature in the above-mentioned step (i) such that sintering does not occur during step (ii), and

(iii) a step of sintering said gel by heating it to a temperature higher than the heating temperature in the abovementioned step (ii) and for a time sufficient to produce said optical glass.

4,426,217
ELECTRIC MELTING OF SOLIDIFIED GLASS IN MELTING UNITS

Gordon A. Farrar, Newark, and Melvin R. Friemoth, deceased, late of Newark, Ohio by Jean M. Friemoth, Executrix, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 17, 1982, Ser. No. 378,542
Int. Cl.³ C03B *5/027*
U.S. Cl. 65—135 **9 Claims**



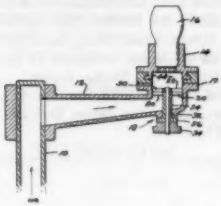
1. A method of melting solidified glass in a submerged throat of a glass melting furnace comprising providing at least a first electrode in the melter chamber supply slot, providing a second electrode in the covered submerged throat, heating glass about said first electrode to a conductive condition around said first electrode and supplying electric energy between said first electrode and said second electrode to establish a Joule effect conductive path therebetween to more fully melt the glass therebetween, subsequent electrodes adjacent said second electrode along the length of the covered submerged throat, sequentially supplying electric energy between said first electrode and subsequent electrodes along said submerged throat to sequentially thaw the solidified glass by conduction of heat from the region between the first electrode and second electrode until the glass around the subsequent electrodes become conductive and electric power for Joule effect heating can be applied to subsequent electrodes in the submerged throat until all of the glass in the submerged throat is molten.

5. An electrode arrangement for melting solidified glass in a submerged outlet throat of a glass melting furnace comprising a series of spaced apart electrodes including a first electrode at the entry to the throat and a last electrode at the exit of the throat, at least one additional electrode in said throat between said first and said last electrode, means for melting glass around said first electrode to provide molten glass between said first electrode and said additional electrode, electric energy means for establishing a Joule effect current therebetween for melting glass about said additional electrode to provide molten glass for establishment of a conductive path between said additional electrode and its next adjacent electrode, sequentially applying electric energy means between said first electrode and said next adjacent electrode until a molten glass conductive path is completed through the submerged throat between said first electrode and said last electrode.

4,426,218
MACHINE FOR HANDLING AND COOLING HOT GLASSWARES ARTICLES

Armando Cabrera-Montante, and Jose J. Ogushi-Perez, both of Monterrey, Mexico, assignors to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Sep. 3, 1982, Ser. No. 335,804
Int. Cl.³ C03B *9/44*
U.S. Cl. 65—241 **9 Claims**



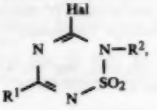
1. In a machine for forming glassware articles and the like, the combination which includes press and blow molds in which hot glassware articles are produced in finished form, including a horizontal arm receiving the hot glassware articles from the molds, a rotatable and vertically movable shaft carrying said arm, said arm and vertical shaft being hollow and in communication with each other, means for imparting rotation to said shaft and arm carried thereby, means imparting vertical movement to the shaft and the arm carried thereby, and means supplying air under pressure through said shaft and arm to cool the hot glassware articles received by the arm.

4,426,219
2H-1,2,4,6-THIATRIAZINE-1-DIOXIDES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Berhard Hamprecht, Weinheim, and Bruno Wuerzer, Otterstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 23, 1982, Ser. No. 410,836
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134143
Int. Cl.³ C07D *285/00*; A01N *43/72*
U.S. Cl. 71—91 **7 Claims**

1. A 2H-1,2,4,6-thiatriazine-1,1-dioxide of the formula



(I)

where R^1 is hydrogen, a saturated or unsaturated straight-chain aliphatic radical of not more than 10 carbon atoms, a saturated or unsaturated branched aliphatic radical of 3 to 10 carbon atoms, a straight-chain or branched saturated alipatic radical of 2 to 10 carbon atoms which is substituted by halogen, alkoxy or alkylmercapto of 1 to 4 carbon atoms, a cycloaliphatic radical of 3 to 7 carbon atoms, alkylamino, alkenylamino, dialkylamino or dialkenylamino, where alkyl or alkenyl is of not more than 6 carbon atoms, phenyl which is unsubstituted or substituted by halogen, alkyl or alkoxy of 1 to 4 carbon atoms, or unsubstituted or halogen-substituted benzyl, R^2 is hydrogen, a straight-chain saturated or unsaturated aliphatic radical of not more than 10 carbon atoms, a branched saturated or unsaturated aliphatic radical of 3 to 10 carbon atoms, a cycloaliphatic radical of 3 to 7 carbon atoms, a haloalkyl radical of 2 to 10 carbon atoms or an alkoxyalkyl radical of 2 to 6 carbon atoms and Hal is halogen.

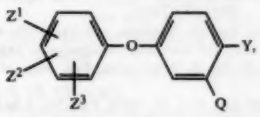
7. A process for combating the growth of unwanted plants, wherein the plants and/or their location are treated with a herbicidally effective amount of a 2H-1,2,4,6-thiatriazine-1,1-dioxide of the formula I as claimed in claim 1.

4,426,220
DIPHENYL ETHERS, THEIR PREPARATION AND THEIR USE AS HERBICIDES

Adolf Parg, Bad Durkheim; Gerhard Hamprecht, Weinheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

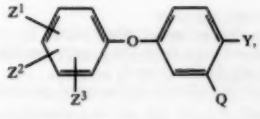
Filed Nov. 25, 1981, Ser. No. 324,984
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045805
Int. Cl.³ C07C *101/04*; A01N *31/00*
U.S. Cl. 71—98 **9 Claims**

1. A diphenyl ether of the formula



where Z^1, Z^2 and Z^3 independently of one another are each hydrogen, halogen, nitro, cyano, carboxyl, alkyl of 1 to 4 carbon atoms, or haloalkyl, alkoxy, haloalkoxy, alkylmercapto, haloalkylmercapto, alkylsulfinyl, haloalkylsulfinyl, alkylsulfonyl or haloalkylsulfonyl where alkyl is in each case of 1 to 4 carbon atoms, Y is hydrogen, halogen, cyano or nitro and Q is —CO—NA—OR^1, where A is hydrogen, alkyl of 1 to 4 carbon atoms, a metal ion or an unsubstituted or trialkyl substituted ammonium ion and R^1 is carboxyalkyl, alkoxycarbonylalkyl or carbamylalkyl of not more than 10 carbon atoms.

9. A herbicide containing inert additives and, as active ingredient, a diphenyl ether of the formula



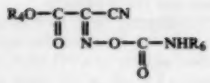
where Z^1, Z^2 and Z^3 independently of one another are each hydrogen, halogen, nitro, cyano, carboxyl, alkyl of 1 to 4 carbon atoms, or haloalkyl, alkoxy, haloalkoxy, alkylmercapto, haloalkylmercapto, alkylsulfinyl, haloalkylsulfinyl, alkylsulfonyl or haloalkylsulfonyl where alkyl is in each case of 1 to 4 carbon atoms, Y is hydrogen, halogen, cyano or nitro and Q is —CO—NA—OR^1, where A is hydrogen, alkyl of 1 to 4 carbom atoms, a metal ion or an unsubstituted or trialkyl substituted ammonium ion and R^1 is carboxyalkyl, alkoxycarbonylalkyl or carbamylalkyl of not more than 10 carbon atoms.

4,426,221
OXIME CARBAMATES FOR THE PROTECTION OF CULTIVATED CROPS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 112,049, Jan. 14, 1980, which is a continuation of Ser. No. 938,205, Aug. 30, 1978, abandoned. This application Sep. 28, 1982, Ser. No. 425,812
Int. Cl.³ A01N *37/34*; C07C *121/78*
U.S. Cl. 71—105 **8 Claims**

1. A compound of the formula



wherein

R_4 is lower alkyl, allyl, cyclohexyl or phenpropenyl, and

R_6 is lower alkyl, lower haloalkyl, or phenyl optionally substituted by halogen, lower alkyl, lower alkoxy, trifluoromethyl or nitro.

7. A method for protecting cultivated plants from bein damaged by harmful agricultural chemicals selected from the group consisting of triazines, haloacetanilides and pyridyloxyphenoxypropionates, which method comprises applying to said plants, to parts threof or to the locus of their growth, an antidotally effective amount of a compound according to claim 1.

4,426,222

CARBAMINIC ACID ESTERS WITH HERBICIDAL PROPERTIES

Gerhard Boroschewski; Ludwig Nüsslein, and Friedrich Arndt, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

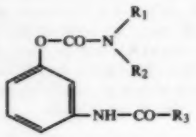
Division of Ser. No. 87,637, Oct. 23, 1979, Pat. No. 4,344,790. This application Jan. 4, 1982, Ser. No. 337,003

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1978, 2844806

Int. Cl.³ A01N *37/44;* **C07C** *125/06*

U.S. Cl. 71—111 **7 Claims**

1. A compound of the formula



wherein R_1 is halogen-C_1–C_2-alkyl;

R_2 is phenyl optionally mono- or disubstituted by one or more substituents selected from the group consisting of halogen, methyl and methoxy; and

R_3 is C_1–C_8 alkyl, C_2–C_8 alkenyl, cyclopropyl or trichloromethyl.

6. A herbicidal composition containing a herbicidally effective amount of at least one compound as per claim 1, further comprising carrier material.

7. A composition as per claim 6, further comprising other additives.

4,426,223

REFINING OF FERROCHROMIUM METAL

Thomas R. Curr, Houghton Johannesburg, and Nicholas A. Barcza, Randburg, both of South Africa, assignors to Council for Mineral Technology, Randburg and Middleburg Steel and Alloys (Proprietary) Limited, Sandown, both of, South Africa

Filed Oct. 18, 1982, Ser. No. 434,752

Claims priority, application South Africa, Oct. 19, 1981, 81/7209

Int. Cl.³ C22B *4/00*

U.S. Cl. 75—10 R **17 Claims**

1. A process for refining ferrochromium metal containing carbon or silicon by the removal of at least some of the carbon or silicon comprising the steps of:

(a) feeding the ferrochromium metal and at least one metal oxide to a furnace having a substantially carbon free environment;

(b) heating the ferrochromium metal and metal oxide by a transferred arc thermal plasma to a sufficiently high temperature both to maintain a slag phase containing the metal oxide and a ferrochromium metal phase in the molten condition, and to effect by the reduction of the metal oxide a liquid slag to liquid metal refining; and

(c) tapping the slag and ferrochromium metal.

4,426,224

LANCE FOR POWDER TOP-BLOW REFINING AND PROCESS FOR DECARBURIZING AND REFINING STEEL BY USING THE LANCE

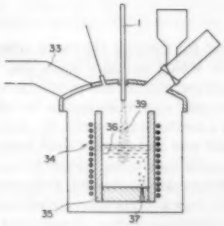
Kaoru Shimme, Kyoto; Takeo Aoki, Kawanishi, and Masayuki Taga, Kobe, all of Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Gaisha, Osaka, Japan

Filed Dec. 20, 1982, Ser. No. 451,046

Claims priority, application Japan, Dec. 25, 1981, 56-215415; Aug. 19, 1982, 57-143778

Int. Cl.³ C21C *7/10*

U.S. Cl. 75—49 **7 Claims**



1. A powder top-blow refining lance for metal refining under vacuum, comprising a double pipe structure consisting essentially of inner pipe means for passing a powder and a carrier gas in which the powder is carried and outer pipe means for passing an accelerating gas, a nozzle hole disposed at the front end of said lance and connected to the inner pipe means, and a plurality of Laval nozzle holes disposed around said nozzle hole and connected to the outer pipe means, said Laval nozzle holes being constructed and arranged such that the accelerating gas which has passed therethrough causes convergence of the powder which has passed through the inner pipe means and out the nozzle hole.

4,426,225

GOLD RECOVERY METHOD

Noble N. Ida, Boulder, and William D. Wagner, Denver, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 29, 1982, Ser. No. 427,365

Int. Cl.³ C22B *11/04*

U.S. Cl. 75—118 R **2 Claims**

1. A method for the recovery of visible gold plate, in pure or alloyed form, adhered to a support lamina of printed circuit board scrap material by an at least partially visible underplating selected from the group consisting of copper, nickel, tin and alloys thereof, comprising the steps of:

(a) preferentially etching away the underplating with an aqueous etching solution comprising approximately 50% weight percent HNO_3 and a froth producing agent, thereby to form an aqueous pregnant etch liquor containing solublized underplating, derived from a chemical tunneling effect and vigorous frothing action under the visible gold plate, and the gold in flake form;

(b) physically separating the gold flake from the pregnant etch liquor; and

(c) recovering gold flake of substantially the analysis of the gold plate of said scrap material.

4,426,226

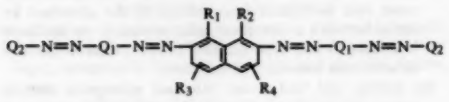
RECORDING LIQUID

Tokuya Ohta, Yokohama, and Tsuyoshi Eida, Ichikawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,995
Claims priority, application Japan, Jul. 1, 1981, 56-103784
Int. Cl.³ C09D 11/02
U.S. Cl. 106—22 4 Claims

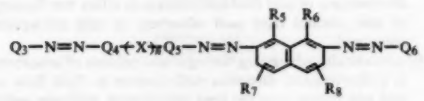
1. A recording liquid comprising a recording agent for giving recorded images and a liquid medium for dissolving or dispersing the recording agent, characterized in that the recording agent comprises at least one of the compounds represented by the following formula (A) and at least one of the compounds represented by the following formula (B):

Formula (A)



wherein Q_1 and Q_2 each represent benzene ring residue or naphthalene ring residue, unsubstituted or substituted by amino, hydroxyl, or sulfo; R_1 and R_2 each represent hydrogen, hydroxyl, or amino; and R_3 and R_4 each represent hydrogen or sulfo in the form of salt with an alkali selected from sodium, lithium, potassium, ammonium, and amines, wherein the number of sulfo groups in the molecule is 2 to 8;

Formula (B)



wherein Q_3 and Q_6 each represent phenyl or naphthyl, substituted or unsubstituted; Q_4 and Q_5 each represent 1,4-phenylene or 1,4-naphthylene, substituted or unsubstituted; R_5 and R_6 each represent hydrogen, hydroxyl, or amino; R_7 and R_8 each represent hydrogen or sulfo in the form of salt with an alkali selected from sodium, lithium, potassium, ammonium, and amines; X represents —NH—, —N=N—, or —CH=CH—; and n is 0 or 1.

4,426,227

PRINTING COMPOSITIONS

Robert A. Keeling, and John Hunt, both of Stoke-on-Trent, England, assignors to Harrison Mayer Limited, Stoke-on-Trent, England

Filed Sep. 28, 1981, Ser. No. 306,392
Claims priority, application United Kingdom, Jan. 10, 1980, 8031658
Int. Cl.³ C09D 11/02
U.S. Cl. 106—27 10 Claims

1. A solvent-free ink for use in offset printing by means of a silicone pad on an article of ceramic and like materials, said ink consisting of:

40–80% by weight of coloring material, and

60–20% by weight of a printing medium which becomes fluid at a temperature of 40°–80° C., has a viscosity of 1–60 poises at a shear rate of 615 sec^{-1} in the temperature range of 40°–80° C., the printing medium consisting of:

a mixture of 30–98% by weight of a thermoplastic component consisting of a film-forming thermoplastic resin having a softening point within the range 105°–170° C. selected from the group consisting of methacrylate resin, ethyl cellulose, isobutyl methacrylate and rosin maleic pentaerythritol ester and another thermoplastic resin of lower softening point within the range of 5°–90° C. selected from the group consisting of styrene resin, glycerol rosin ester and methyl ester of hydrogenated rosin,

and 70–2% by weight of a diluent selected from the group consisting of (a) an ester selected from palmitates, stearates and laurates, (b) a fatty alcohol selected from myristyl alcohol, cetyl alcohol and stearyl alcohol and (c) a saturated fatty acid selected from capric acid, lauric acid and myristic acid,

said ink forming in use a coherent but semi-fluid film on the silicone pad and transferring in its entirety from the pad to the article to form immediately a solid coating on the article.

4,426,228

CELLULOSIC MOLDING AND SPINNING COMPOUND WITH LOW CONTENTS OF LOW-MOLECULAR DECOMPOSITION PRODUCTS

Alexander Brandner, Erlenbach am Main, and Hand G. Zengel, Kleinwallstadt, both of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Filed Aug. 26, 1981, Ser. No. 296,519
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034685
Int. Cl.³ C08L 1/00, 1/02
U.S. Cl. 106—203 15 Claims

1. Molding or spinning substance, comprising by weight 4.99–25% cellulose, 95–50% of a tertiary amine oxide, in given instances up to 25% of a non-solvent and up to 10% of other polymers, all proportions relative to the weight of the molding or spinning substance, and as additive, singly or in a mixture, 0.01 up to 0.5% by weight, relative to the tertiary amine oxide, of an organic compound with a minimum of four carbon atoms and a minimum of two conjugated double bonds and a minimum of two groups in the form of hydroxyl and/or amino groups which, in turn, have a minimum of one unsubstituted hydrogen atom and/or contain glycerol aldehyde, said additive being soluble in said tertiary amine oxide as well as its mixture with said non-solvent.

4,426,229

OXIDIZED ALPHA-OLEFINS

Malcolm E. Bolton, and Joseph O. Bienvenu, both of Longview, Tex., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 745,159, Nov. 26, 1976, which is a continuation of Ser. No. 340,378, Mar. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 860,819, Sep. 24, 1969, abandoned. This application Sep. 26, 1980, Ser. No. 191,462
Int. Cl.³ C08L 91/06
U.S. Cl. 106—270 40 Claims

1. A wax comprising a mixture of oxidized alpha-olefins, said aliphatic alpha-olefins comprising a mixture of alpha-olefins having the following characteristics:

Carbon No. Distribution, Wt. %	
C_{28} and lower	max. 28
C_{30} and higher	min. 72
Appearance: at 175–185° F.	Clear & bright
Color, Saybolt	min. 0
Viscosity, SUS: Sec. at 210° F.	max. 59.2
Viscosity, Kin: Cs. at 210° F.	max. 10.0
Melting Point, D 127: °F.	max. 175

the acid number of said wax being between about 30 and 50 and the penetration value ranging from substantially that of said mixture of aliphatic alpha-olefins prior to oxidation to one 1.6 times that of said mixture of aliphatic alpha-olefins prior to oxidation.

4,426,230

FILLING MATERIALS FOR COMMUNICATIONS CABLE

Lawrence E. Davis, Hickory, and Naren I. Patel, Valdese, both of N.C., assignors to Siecor Corporation, Hickory, N.C.

Division of Ser. No. 317,483, Nov. 2, 1981, Pat. No. 4,382,821, which is a division of Ser. No. 146,339, May 2, 1980, Pat. No. 4,333,706, which is a continuation-in-part of Ser. No. 106,866, Dec. 26, 1979, abandoned. This application Sep. 27, 1982, Ser. No. 423,818

Int. Cl.³ C08L *91/00, 91/06*

U.S. Cl. 106—272 6 Claims

1. A composition of matter comprising a mixture of petrolatum, glycerol hydroxy stearate and inorganic hollow microspheres within:

(a) the inorganic hollow microspheres are 10 to 20 weight percent glass microspheres having diameters from 20 to 200 microns;

(b) the glycerol hydroxy sterate is from 2 to 10 weight percent dissolved in said petrolatum; and,

(c) the balance being petrolatum.

4,426,231

LIGHT STABLE QUINACRIDONEQUINONE PIGMENTS

Wilfried G. Höltje, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 12, 1982, Ser. No. 407,644

Int. Cl.³ C07F *15/00*

U.S. Cl. 106—288 Q 4 Claims

1. A process of photostabilizing a pigment composition which consists essentially of quinacridonequinone or a solid solution thereof comprising treating said pigment composition dispersed in aqueous slurry with from 2.5 to 20 percent by weight, based on quinacridonequinone, calculated as $Mn(OH)_2$, of an aqueous solution of a divalent manganese salt and supplying OH^- ions to said aqueous solution to slowly precipitate a manganese species on the pigment composition.

4,426,232

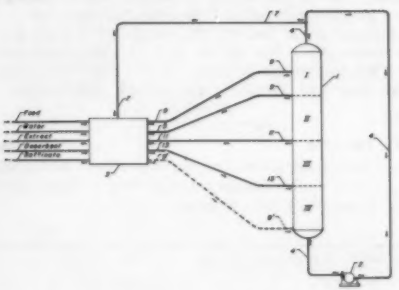
EXTRACTION OF SUCROSE

Richard W. Neuzil, Downers Grove, and Richard L. Fergin, Mt. Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 246,349, Mar. 23, 1981, abandoned. This application Oct. 2, 1981, Ser. No. 308,013

Int. Cl.³ C13D *3/12*

U.S. Cl. 127—46.3 13 Claims



1. A process for separating sucrose from an aqueous solution of sucrose and at least one of the compounds comprising betaine and a mineral salt which process comprises contacting at adsorption conditions said solution with a solid adsorbent exhibiting selectivity for said sucrose, which process comprises the steps of:

(a) providing net positive fluid flow through all portions of a column of said adsorbent in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones;

(b) providing the first of said at least three zones as an adsorption zone in said column, said zone defined by the adsorbent located between a feed inlet stream of said solution at an upstream boundary of said zone and a raffinate outlet stream at a downstream boundary of said zone;

(c) providing another of said at least three zones as a purification zone immediately upstream from said adsorption zone, said purification zone defined by the adsorbent located between an extract outlet stream at an upstream boundary of said purification zone and said feed inlet stream at a downstream boundary of said purification zone;

(d) providing another of said at least three zones as a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent inlet stream at an upstream boundary of said zone and said extract outlet stream at a downstream boundary of said zone;

(e) passing said feed stream into said adsorption zone at adsorption conditions to effect the selective adsorption of sucrose by said adsorbent in said adsorption zone and withdrawing a raffinate outlet stream from said adsorption zone;

(f) passing a desorbent comprising alcohol into said desorption zone at desorption conditions to effect the displacement of said sucrose from the adsorbent in said desorption zone;

(g) withdrawing an extract stream comprising said sucrose and desorbent material from said desorption zone;

(h) passing a water inlet stream into said adsorption zone downstream of said feed inlet stream to effect the flushing of said alcohol from said adsorbent in said adsorption zone; and,

(i) periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone the feed inlet stream, raffinate outlet stream, desorbent inlet stream, extract outlet stream and water inlet stream to effect the shifting of zones through said adsorbent and the production of extract outlet and raffinate outlet streams.

4,426,233

METHOD FOR DISPOSAL OF SLUDGE IN FLOATING ROOF TYPE OIL TANK

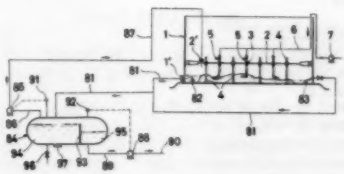
Nobuyuki Manabe, Fujisawa, and Takahiro Goto, Yachiyo, both of Japan, assignors to Taiho Industries Co. Ltd. and O.P.E. Co. Ltd., both of Tokyo, Japan

Filed Apr. 7, 1982, Ser. No. 366,319

Claims priority, application Japan, Sep. 11, 1981, 56-142446; Dec. 28, 1981, 56-209734

Int. Cl.³ B08B *5/04;* C02F *3/02*

U.S. Cl. 134—21 16 Claims



1. A method for the disposal of sludge collecting within a tank, comprising the steps of:

mounting at least one pressurized liquid spurting device, comprising at least two relatively movable members, within said tank;

selectively moving one of said at least two relatively mov-

able members relative to said other one of said at least two relatively movable members so as to selectively change the geometrical configuration of said spurting device and thereby the application angle of said pressurized liquid relative to said collecting sludge;

spurting said pressurized liquid from said spurting device onto said collecting sludge within said tank so as to thereby disintegrate and fluidize said sludge; and

removing said disintegrated and fluidized sludge from said tank.

4,426,234

METHOD OF FORMING REPRODUCIBLE IMPURITY ZONE OF GALLIUM OR ALUMINUM IN A WAFER BY IMPLANTING THROUGH COMPOSITE LAYERS AND DIFFUSION ANNEALING

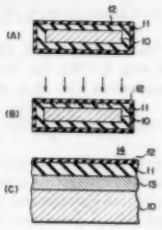
Jiro Ohshima, Yokohama; Yutaka Koshino, Yokosuka; Takashi Ajima, Kamakura, and Toshio Yonezawa, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 3, 1981, Ser. No. 327,190

Claims priority, application Japan, Dec. 4, 1980, 55-171304

Int. Cl.³ H01L *21/225, 21/425, 21/74*

U.S. Cl. 148—1.5 6 Claims



1. A method for fabricating a semiconductor device comprising the steps of:

a. forming, on a surface of a silicon substrate, a first thin film having a gallium diffusion coefficient greater than the gallium diffusion coefficient of said substrate;

b. forming on a surface of said first thin film, a second thin film having a gallium diffusion coefficient smaller than said gallium diffusion coefficient of said first thin film;

c. ion-implanting gallium through said second thin film into said first thin film to form a P-type impurity region; and

d. effecting annealing to set a junction depth of said P-type impurity region to a predetermined value.

4,426,235

COLD-ROLLED HIGH STRENGTH STEEL PLATE WITH COMPOSITE STEEL STRUCTURE OF HIGH R-VALUE AND METHOD FOR PRODUCING SAME

Masatoshi Sudo, Kobe; Hiromi Hori, Akashi; Ichiro Tsukatani, and Zenichi Shibata, both of Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 26, 1982, Ser. No. 342,841

Claims priority, application Japan, Jan. 26, 1981, 56-10539; Jan. 26, 1981, 56-10540

Int. Cl.³ C21D *8/04*

U.S. Cl. 148—12 C 17 Claims

1. A high strength cold rolled steel plate or sheet consisting essentially of:

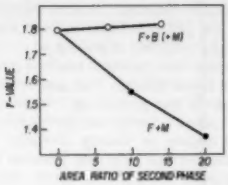
carbon: 0.02–0.15% by weight

manganese: 0.02–0.7% by weight

aluminum: 0.01–0.1% by weight

nitrogen: 0.002–0.01% by weight

balance iron and inevitable impurities, said steel having a microstructure comprising ferrite and bainite, and possibly subordinate martensite, wherein the area ratio of said bainite is 2–30%, the area ratio of said martensite is not greater than 8%,



and the area ratio of the martensite is less than that of the bainite, said steel having an r-value greater than 1.5.

4,426,236

METHOD FOR MANUFACTURING HIGH STRENGTH RAIL OF EXCELLENT WELDABILITY

Kazuo Sugino; Hideaki Kageyama, and Hiroki Masumoto, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Japan

Division of Ser. No. 202,195, Oct. 30, 1980, Pat. No. 4,375,995, which is a continuation-in-part of Ser. No. 37,146, May 8, 1979, abandoned. This application Jan. 18, 1982, Ser. No. 340,335

Claims priority, application Japan, May 12, 1978, 53-56330

The portion of the term of this patent subsequent to Mar. 8, 2000, has been disclaimed.

Int. Cl.³ C22C *38/26*

U.S. Cl. 148—36 5 Claims

1. A high strength steel rail of excellent weldability, said steel containing 0.65 to 0.85% of C, 0.50 to 1.20% of Si, 0.50 to 1.50% of Mn, 0.005 to 0.050% of Al, 0.004 to 0.050% of one or both of Nb and Ti, and the balance being iron and unavoidable impurities and said rail having a surface layer on the head thereof to a depth of 10 mm or more, said surface layer having a fine pearlite structure with a tensile strength or more than 120 kg/mm², a reduction of area of more than 40% and a surface hardness at the surface layer of H_V 350 or more,

the weldability of said rail being such that when said rail head is welded, the welded portion has properties which are almost the same as those of the non-welded portion.

4,426,237

VOLATILE METAL OXIDE SUPPRESSION IN MOLECULAR BEAM EPITAXY SYSTEMS

John L. Freeouf, Peekskill, N.Y.; Peter D. Kirchner, State College, Pa.; George D. Pettit, Mahopac, and Jerry M. Woodall, Bedford Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

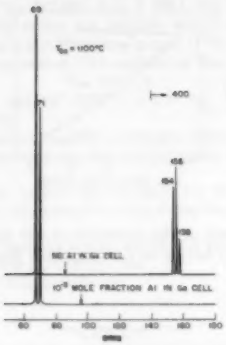
Filed Oct. 13, 1981, Ser. No. 311,091

Int. Cl.³ H01L *21/203, 21/363*

U.S. Cl. 148—175 10 Claims

1. In a molecular beam source for providing a molecular beam, wherein said source contains a source material having an inherent contaminant, the improvement comprising the addition in said source a second material having an affinity for said contaminant, said second material has the property that upon

heating said second material combines with said contaminant thereby providing a molecular beam of said source material,



said molecular beam being substantially free of both said contaminant and said second material.

4,426,238

BLASTING COMPOSITION CONTAINING PARTICULATE OXIDIZER SALTS

Daniel A. Wasson, Sandy, Utah, assignor to IRECO Chemicals, Salt Lake City, Utah

Filed Sep. 14, 1979, Ser. No. 75,577

Int. Cl.³ C06B *31/30*

U.S. Cl. 149—60 **7 Claims**

1. A stable aqueous blasting composition comprising inorganic oxidizer salt in particulate form, a solution of oxidizer salt in water forming a continuous aqueous phase, an immiscible liquid organic fuel finely dispersed throughout the aqueous phase, a thickener, a crystal habit modifier, and a nonionic surfactant having a hydrophilic character as shown by an HLB value above 11.0, selected from the group consisting of nonylphenol ethoxylates and linear ethoxylated alcohols having from about 11 to about 20 carbon atoms to retard desensitization of the composition that would otherwise occur due to the presence of the salt particles.

4,426,239

METHOD OF CONTROLLING THE FILM THICKNESS OF FLAT FILMS PRODUCED IN FLAT FILM EXTRUDER INSTALLATIONS

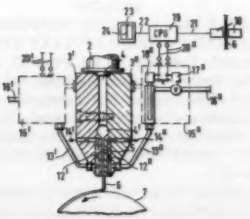
Hartmüt Upmeier, Jahnstrasse 25, 4540 Lengerich of Westphalia, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 235,618

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006566

Int. Cl.³ B29D *7/02*

U.S. Cl. 156—64 **7 Claims**



1. A method of controlling the thickness of flat films produced in flat film extruder installations or films coated in extruder laminating installations, said method comprising:

measuring thicknesses over the width of a flat film extruded from or coated by a sheet die and feeding the measured thicknesses to a processing unit;

subdividing the width of the flat film into equally long film sections (x_F) within the processing unit;

associating the film sections with correcting sections (x_K) of the sheet die from which they were extruded;

determining within the processing unit from the measurements of thicknesses mean thickness distributions (s_x') for the individual film sections (x_F); and

selecting one of the mean thickness distributions (s_x') as a target value, the deviations of the values of the other mean thickness distributions (s_x') forming measures for correcting signals for setting elements of the individual correcting sections (x_K) at the sheet die that are associated with the respective film sections (x_F), adjustment of the setting elements controlling the film thicknesses.

4,426,240

ADHESIVE COMPOSITIONS AND METHOD EMPLOYING SAME

Eckhart Louis, Burghausen; Ernst Aigner, Tyrlaching, and Wolfgang Hechtl, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 184,555, Sep. 5, 1980, abandoned. This application Aug. 4, 1982, Ser. No. 405,135

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1979, 2940917

Int. Cl.³ B32B *17/00*

U.S. Cl. 156—99 **8 Claims**

1. An adhesive composition for bonding unprimed substrates together which comprises substantially linear organopolysiloxanes having SiC-bonded vinyl groups and Si-bonded hydrogen atoms, and a catalyst which promotes the addition of Si-bonded hydrogen to vinyl groups, in which all the organopolysiloxanes are free of Si-bonded hydroxyl and alkoxy groups and contain an average of from 2 to 1,000 silicon atoms per molecule in which at least 99.5 percent of the number of Si-bonded hydrogen atoms are bonded to organopolysiloxanes having one Si-bonded hydrogen atom and one SiC-bonded vinyl group per molecule and at least 99.5 percent of the number of SiC-bonded vinyl groups are bonded to organopolysiloxanes having one Si-bonded hydrogen atom and one SiC-bonded vinyl group per molecule.

6. The process for bonding two substrates together which comprises coating one surface of a substrate with the composition of claim 1 and then contacting the coated surface of one substrate with the other substrate.

4,426,241

BELT LOOP FABRICATING APPARATUS AND METHOD

Hubert Zimmermann, Aachen, and Thomas Kempf, Wuppertal, both of Fed. Rep. of Germany, assignors to Otto Brand GmbH, Wuppertal, Fed. Rep. of Germany

Filed Aug. 18, 1982, Ser. No. 409,075

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1981, 3132862

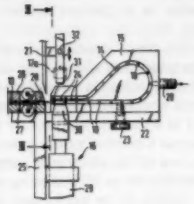
Int. Cl.³ B31F *1/00*

U.S. Cl. 156—217 **17 Claims**

1. A method for the fabrication of hanging loops from a tape comprised of fabric comprising the steps of:

advancing the free end of the tape along a groove to define a loop, the groove being contoured to cause the free tape end to be doubled back on the remainder of the tape in a region in front of the point of entrance of the tape into the groove whereby said free end will be in adjacent overlapping relationship therewith and substantially parallel to the advancing direction of the tape;

bonding the tape to itself in the region where it is overlapping to permanently close the loop;



severing the bonded loop from the tape; and

ejecting the severed loop from the groove.

4,426,242

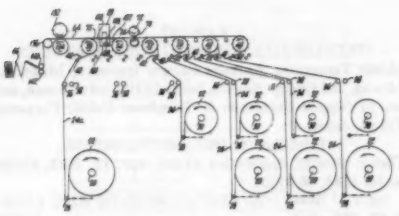
METHOD FOR PRODUCING A MANIFOLD ASSEMBLY

Ivars Sarkans, Phoenix, Md., and Charles A. Figgins, Cincinnati, Ohio, assignors to American Standard, Inc., New York, N.Y.

Division of Ser. No. 889,016, Mar. 22, 1978, Pat. No. 4,307,897. This application Oct. 27, 1981, Ser. No. 315,401

Int. Cl.³ B32B *31/04, 31/18*

U.S. Cl. 156—252 **9 Claims**



1. A process for producing a manifold assembly in a collating apparatus that comprises collating a plurality of sheets in superimposed relationship within said apparatus; striking crimp legs in registry through said superimposed sheets and depressing the free ends of said crimp legs and the free terminal margins thereof in a substantially fully extended state below the plane of said superimposed sheets from which said crimp legs are struck when said sheets are in planar alignment, the free ends of said crimp legs including said free terminal margins facing in the direction of passage of said superimposed sheets through said apparatus and at an angle of less than about 90° from the plane of said superimposed sheets from which said legs are struck for the purpose of applying adhesive to said free terminal margins of said legs; and depositing adhesive on said free terminal margins of said crimp legs in their substantially fully extended state; collating said superimposed sheets with an exterior base sheet; and affecting adhesion of said free-terminal margins of said crimp legs to the interior surface of said exterior base sheet.

4,426,243

ROOM-TEMPERATURE-CURABLE, QUICK-SETTING ACRYLIC/EPOXY ADHESIVES AND METHODS OF BONDING

Paul C. Briggs, Danvers, Mass., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 1, 1981, Ser. No. 326,355

Int. Cl.³ C09J *5/02*

U.S. Cl. 156—307.3 **26 Claims**

1. A method of obtaining a quick-setting, strong, durable, heat-resistant and solvent-resistant adhesive bond between two surfaces, comprising: applying to one of said surfaces a polymerizable mixture comprising a polymerizable acrylic-based ester material, a polymerizable epoxide-based material, a bifunctional molecular material reactable with said acrylic-based material and said epoxide-based material, and a catalyst; causing an activator to be applied to the other one of said surfaces; and bringing said surfaces together with said mixture and said activator therebetween, said epoxide-based material being in an effective amount for promoting said strong, durable, heat-resistant and solvent-resistant adhesive bond, the ester material amount being relatively greater by weight than the bifunctional material amount, said ester and bifunctional molecular material amounts being effective for causing said adhesive bond to cure at room temperature, said mixture polymerizing and said adhesive bond curing at said room temperature.

4,426,244

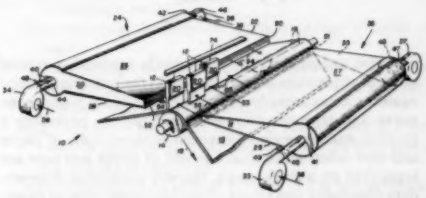
COOLING DEVICE FOR ULTRASONIC HORNS

Kenneth Y. Wang, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Aug. 31, 1982, Ser. No. 413,445

Int. Cl.³ B29C *27/08*

U.S. Cl. 156—498 **15 Claims**



1. A cooling apparatus adapted to being operatively associated with an ultrasonic bonding system of the type including a plurality of bonding horns in juxtaposition with and disposed across the width of a moveable web of textile material, means for imparting ultrasonic vibratory movement to said bonding horns so as to effect bonding of said web at points where individual fibers thereof contact one another, and means for moving said web into bonding position with said bonding horns, said cooling apparatus comprising:

cooling means having an inlet and an outlet for directing a cooling fluid to impinge upon exterior side surfaces of said plurality of bonding horns, whereby said outlet is positioned in close relationship to each of said bonding horns so as to deliver a stream of cooling fluid at or above the nodal area thereof, said cooling fluid thereby counteracting the tendancy of said bonding horns to experience deleterious temperature elevation due to heat naturally generated at the nodal area in addition to heat radiated through the horn at the bonding surface and conducted therethrough.

4,426,245

MASKING APRON DISPENSING APPARATUS

Michael E. Driscoll, and Wilson O. Boozer, III, both of P.O. Box 12194, Gainesville, Fla. 32604

Filed Feb. 22, 1983, Ser. No. 468,755

Int. Cl.³ B31F *5/06;* **B32B** *31/18*

U.S. Cl. 156—511 **13 Claims**

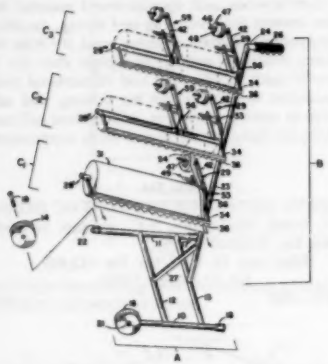
1. A tape and masking apron dispensing apparatus for rolls of paper and tape comprising:

a base unit;

a supporting unit attached to said base unit and extending generally upwardly therefrom; and

at least one paper roll shaft unit attached to said support unit; each paper roll shaft unit comprising (a) a shaft for receiv-

ing and supporting at least one roll of paper, said shaft being connected to said support unit and extending generally perpendicularly therefrom such that the axis of each supported roll of paper forms an acute angle with the plane supporting said base unit, (b) cutter bar means mounted to said shaft for cutting dispensed tape and paper to length, and (c) at least one roller bar assembly means



mounted to said shaft (i) for retatively supporting at least one roll of pressure sensitive tape, (ii) for pressing the tape against a longitudinally advancing edge of the paper as the paper and tape are dispensed, and (ii) for providing a positive spacing means betweeen adjacent rolls of paper and tape when more than one roll of paper and tape are supported on a single shaft, thereby permitting independent dispensing and taping of the individual rolls of paper.

4,426,246

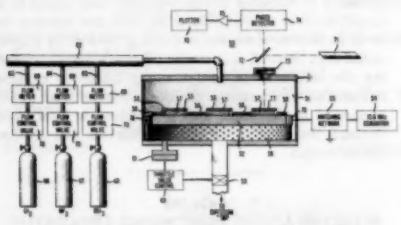
PLASMA PRETREATMENT WITH BCl_3 TO REMOVE PASSIVATION FORMED BY FLUORINE-ETCH

Stanley H. Kravitz, Coopersburg; Ajit S. Manocha, Allentown, both of Pa., and William E. Willenbrock, Jr., Manchester Township, Ocean County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 26, 1982, Ser. No. 401,830

Int. Cl.³ H01L *21/308*

U.S. Cl. 156—643 **8 Claims**



1. A method for manufacturing a device comprising at least one operation in which a layer of the device being manufactured is to be etched, wherein the device is etched in the presence of a plasma contained within an apparatus, the plasma being generated in a gaseous ambient by the application of an electric field across a portion of the gaseous ambient between two electrodes, one of the electrodes supporting the device to be etched, the layer to be etched comprising silicon masked by a pattern of relatively etch-resistant material, the step of etching the layer being performed in a gaseous ambient comprising substantially pure chlorine, the apparatus having been used in a previous etching step in which the gaseous ambient comprised a fluorine-containing compound,

characterized in that

following the previous etching step, a plasma is generated in the apparatus in a gaseous ambient comprising boron trichloride.

2. A method for manufacturing a device comprising at least one operation in which a surface of the device being manufactured is to be etched, wherein the device is etched in the presence of a plasma contained within an apparatus, the plasma being generated in a gaseous ambient by the application of an electric field across a portion of the gaseous ambient between two electrodes, one of the electrodes supporting the device to be etched, the surface to be etched being a silicon material, the etching of the surface to be performed in a gaseous ambient comprising chlorine, the apparatus having been used in a previous etching operation in which the gaseous ambient comprises a fluorine-containing compound,

characterized in that

following the previous etching operation a plasma is generated in the apparatus in a gaseous ambient comprising boron trichloride,

and further characterized in that

after the previous etching operation and prior to loading of the device to be etched in the apparatus, a plasma is generated within the apparatus in a gaseous ambient comprising substantially pure boron tirchloride at a pressure in the range of 5×10^{-3} Torr to 0.1 Torr, the plasma having a power density in the range of 0.1 watts/cm² to 0.5 watts/cm² and maintained for at least two minutes.

4,426,247

METHOD FOR FORMING MICROPATTERN

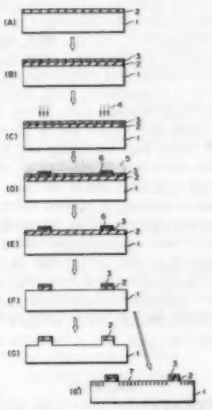
Toshiaki Tamamura, Katsuta; Saburo Imamura, Mito; Masao Morita, and Osamu Kogure, both of Mito, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,613

Claims priority, application Japan, Apr. 12, 1982, 57-59612; Feb. 14, 1983, 58-21731

Int. Cl.³ B44C *1/22;* **C03C** *15/00, 25/06;* **B29C** *17/08*

U.S. Cl. 156—643 **12 Claims**



1. A method for forming a micropattern, comprising the steps of:

forming an organic polymeric material layer on a substrate;

forming a silicone layer on said organic polymeric material layer;

selectively irradiating a surface of said silicone layer with a high-energy beam;

exposing the surface of said silicone layer to a radical addition polymerizable monomer gas so as to form a graft polymer film on an irradiated portion of the surface of said silicone layer;

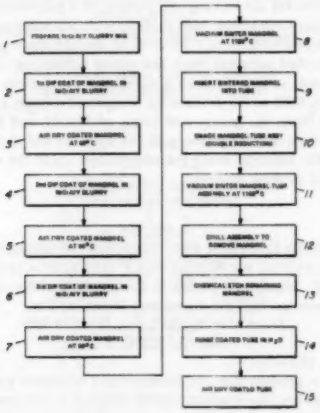
performing dry etching using said graft polymer film as a mask so as to form a pattern of said silicone layer; and

performing dry etching using said pattern of said silicone layer as a mask so as to form a pattern of said organic polymeric material layer.

4,426,248
PROCESS FOR COATING RIFLE TUBES

Raymond P. Jackson, West Chester, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 20, 1983, Ser. No. 496,685
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*; B05D *7/22*
U.S. Cl. 156—645 **10 Claims**



1. A process for coating the inside diameter of a tube with a wear and erosion resistant coating which includes the steps of:

preparing a slurry mixture of nickel, chromium, aluminum and yttrium powders in an aqueous solution;

selecting a mandrel to fit inside of said tube;

repetitively dip coating said mandrel in said slurry mixture;

air drying said coated mandrel after each dip coating;

sintering said coated mandrel in a vacuum furnace;

inserting said coated mandrel into said tube to form a mandrel-tube assembly;

swaging said mandrel-tube assembly to create a reduction in the outside diameter of said tube;

vacuum sintering of said mandrel-tube assembly after it is swaged;

axially drilling said mandrel in said sintered mandrel-tube assembly to remove material therefrom;

chemically etching said drilled mandrel-tube assembly to remove the remaining mandrel material;

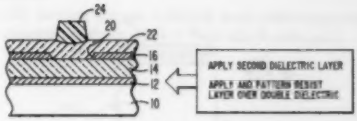
rinsing said chemically etched coated tube in water; and

air drying said coated tube.

4,426,249
COMPOSITION AND THICKNESS VARIATION IN DIELECTRIC LAYERS

Richard Brown, Berkeley Hts., and Phillip C. Jozwiak, Plainsboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,785
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*; C23F *1/02*
U.S. Cl. 156—653 **10 Claims**



1. A method for forming islands of dielectric material of varying thickness on a substrate comprising:

(a) forming a first layer of dielectric material on the substrate;

(b) depositing thereover a thin layer of etchable metal;

(c) forming a patterned layer of resist material over the layer of etchable metal;

(d) removing the exposed portion of the etchable metal layer;

(e) depositing a second layer of dielectric material thereover, said layer contacting the first layer of dielectric layer in the openings in said metal layer;

(f) forming a patterned layer of resist material over the second layer of dielectric material so that only said areas of contact are covered;

(g) removing the exposed portion of the second dielectric layer and the remainder of the etchable metal layer;

(h) forming a patterned layer of resist material over the remaining portion of the second dielectric layer and exposing a portion of the first dielectric layer;

(i) removing the exposed portion of the first dielectric layer.

4,426,250
STRIPPER SYSTEM FOR SURFACES

Michael I. D. Brailsford, Dorton Hill House, Chilton, Nr. Aylesbury, Buckinghamshire, England

Filed Oct. 15, 1981, Ser. No. 311,769
Claims priority, application United Kingdom, Feb. 2, 1981, 8100084; Apr. 29, 1981, 8113249
Int. Cl.³ B44C *1/22*; C03C *15/00*; B08B *7/00*; C23D *17/00*
U.S. Cl. 156—655 **21 Claims**

19. A method for stripping a cured surface coating of paint or varnish from a surface, said method comprising the steps of:

providing a peel-away system for decomposing and stripping away said surface coating, said system including a stripper composition for decomposing said coating and cover means including pile means to which the decomposed surface coating may be attached, said cover means being adapted to cover said composition and said surface coating and further adapted to lift a portion of the decomposed surface coating from said surface;

applying said composition and said cover means to said surface coating;

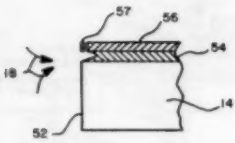
permitting said composition to react with and decompose said surface coating; and

stripping said surface coating by peeling away said cover means.

4,426,251
PORTABLE GOLD RECOVERY APPARATUS AND METHOD FOR USING SAME

Noble Ida; Paul E. Nelson; Peter N. Haugen, all of Boulder; Robert L. Aho, Longmont, and Andrew A. Lucas, Fort Collins, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 29, 1982, Ser. No. 427,364
Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—656 13 Claims



13. A method of recovering gold from printed circuit board tabs in which the gold is bonded to a partially visible metallic underplating, said underplating being bonded to a nonmetallic substrate, said method being adapted for use with a self-contained, portable gold recovery unit having a closable processing chamber, a tank for holding an etching solution, a first means for selectively delivering the etching solution to and from the processing chamber, a second means for selectively delivering a rinsing fluid to and from the processing chamber, and filtering means for filtering said etching solution or rinsing fluid as said fluids are delivered from the processing chamber, said method comprising the steps of:

(a) placing the printed circuit board tabs from which the gold is to be removed in said processing chamber;

(b) filling said holding tank with the etching solution, said etching solution comprising:

an acid that will dissolve said metallic underplating but not the gold bonded thereto, and,

at least one effervescent compound, said effervescent compound being selected to create a vigorous frothing action that will help the gold flake away from the substrate as the metallic underplating is dissolved,

(c) delivering said etching solution to said processing chamber and allowing it to come in contact with the partially visible metallic underplating, whereby a tunneling action begins in which the underplating is dissolved or tunneled out from under the gold, thereby allowing the gold with the help of the frothing action created by said effervescent compound to flake away from said substrate;

(d) removing the etching solution from said processing chamber, and retaining any gold flakes suspended in the etching solution in said filtering means;

(e) rinsing the processing chamber and the nonmetallic substrate contained therein with said rinsing fluid, thereby flushing any remaining gold flakes to said filtering means, and

(f) removing said gold flakes from said filtering means.

4,426,252
PROCESS AND COMPOSITION FOR PREPARING ALUMINUM SURFACES FOR ANODIZING

James M. Kape, Crookham Village, England, assignor to Pennwalt Corporation, Philadelphia, Pa.

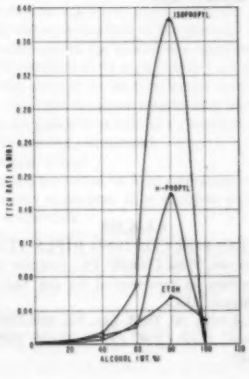
Filed May 9, 1983, Ser. No. 492,757
Claims priority, application United Kingdom, Sep. 23, 1982, 8227118
Int. Cl.³ C23F 1/00; B44C 1/22
U.S. Cl. 156—665 10 Claims

1. A process for etching aluminum alloys to provide a matte surface comprising contacting the surface with an aqueous solution containing hexafluorophosphoric acid.

4,426,253
HIGH SPEED ETCHING OF POLYIMIDE FILM

John A. Kreuz, Columbus, and Christopher M. Hawkins, Clarksburg, both of Ohio, assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 3, 1981, Ser. No. 327,060
Int. Cl.³ B29C 17/08; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—668 2 Claims



1. A process for etching the surface of a polyimide material comprising contacting said surface with an aqueous solution consisting essentially of a 75–85% by weight aqueous solution of an alcohol selected from the group consisting of ethanol, n-propanol, isopropanol or a combination of these alcohols, and from 0.05 to 50 percent by weight of a basic compound selected from the group consisting of NaOH and KOH; the contact time of the surface with the solution and the temperature of the solution being interdependent upon the speed and degree of etching desired.

4,426,254
SOLUBILIZATION OF NONIONIC SURFACTANTS USEFUL IN WOOD PULP DERESINATION

Donald L. Wood, and Judith E. Zweig, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 5, 1982, Ser. No. 374,839
Int. Cl.³ D21C 9/08
U.S. Cl. 162—72 5 Claims

1. In a process for the manufacture of wood pulp which comprises treating a wood pulp by contact at elevated temperature with an aqueous medium containing between about 2 and 15 percent by weight sodium hydroxide and between about 0.2 and 1.0 percent by weight of an ethylene oxide condensation product deresination agent, the improvement which comprises incorporating into the aqueous medium a solubilizing agent which is a C_{12} alpha-olefin sulfonate, with the provision that the weight ratio of said ethylene oxide condensation product in the aqueous medium to said solubilizing agent is between about 9 to 1 and about 1 to 1.

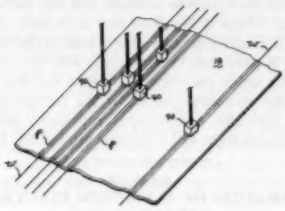
4,426,255
WIRE INSULATING METHOD AND APPARATUS

Benson F. Bachus, and Georg C. E. Dornberger, both of Phoenix, Ariz., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,666
Int. Cl.³ D21D 3/00
U.S. Cl. 162—106 6 Claims

1. Apparatus for insulating a wire with pulp comprising, in combination, a vat adapted to contain a pulpous slurry, a cylinder mold mounted for rotation within said vat partially sub-

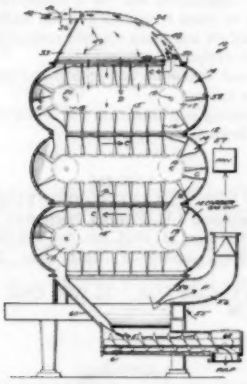
merged in and partially emerged from the pulpous slurry, and an endless belt mounted for movement along an endless path that contacts said cylinder mold at a slurry emerged location whereby a wire may be routed into the vat, over the cylinder mold and into the endless belt embedded in a ribbon of pulp transferred from the mold to the belt, and wherein said apparatus further comprises radio-frequency oscillator means for propagating an electromagnetic field through which said endless path passes and for detecting the absence of the wire therewithin embedded in a ribbon of pulp supported upon said belt, and means for generating a wire break signal upon the detection by said electric field propagating and detecting means of the absence of the wire within the electric field.



4,426,256
APPARATUS FOR TREATING FIBROUS MATERIAL WITH A GAS

Oystein Johnsen, Oslo, Norway, assignor to Myrens Verksted A/S, Oslo, Norway

Filed Mar. 9, 1982, Ser. No. 356,465
Int. Cl.³ D21C 7/06, 7/08, 9/10
U.S. Cl. 162—237 9 Claims



1. Apparatus for continuously treating a porous, fibrous material with gas, comprising:

means for entraining the material with gas, and passing the gas-entrained material in a first path;

means for substantially separating the material from the gas so that the material flows in a second, serpentine, path, and the gas flows in a third path, distinct from the second path;

said means for moving the material in the second path comprising a plurality of air-pervious conveyor belts having conveying portions extending outwardly therefrom, with substantially horizontal portions of alternating conveyor belts moving in opposite directions; and said means defining the third path including the walls of a vertically upstanding vessel, the third path being downward and passing through said plurality of conveyor belts; and said conveying portions and vessel walls comprise a gas-seal defining means substantially preventing leakage of gas there around.

means for moving the material in the serpentine second path so that it intersects the flow of gas in the third path at least once, with the gas passing through the material while remaining in the third path, until the desired treatment of the material with gas has been achieved;

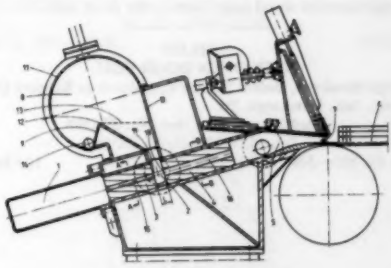
means for moving the material in a fourth path, after treatment; and

means for moving the gas in a fifth path, after treatment of the material, entirely distinct from the fourth path.

4,426,257
DAMPING SYSTEM FOR A PAPER MACHINE HEADBOX

Jukka Antikainen; Osmo Evälahti, both of Karhula, and Tapio Waris, Kyminlinna, all of Finland, assignors to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Oct. 26, 1981, Ser. No. 315,172
Claims priority, application Finland, Jan. 26, 1981, 810202
Int. Cl.³ D21F 1/02
U.S. Cl. 162—336 4 Claims



1. In a papermaking machine, a headbox system for dampening pressure fluctuations, which headbox system comprises an equalizing chamber communicating with an air space; a plurality of inlet channels flow connected with a supplier of pulp stock to deliver same into said equalizing chamber; and a plurality of outlet channels communicating with said equalizing chamber to receive said pulp stock for delivery therefrom; said outlet channels being disposed coaxially with respective inlet channels said inlet channels and outlet channels being of respective sizes and spaced-apart by a distance such that the pulp stock flows divergently from each inlet channel to the respective outlet channel across said equalizing chamber; the cross-sections of the inlet and outlet channels being circular, and related in diameter and inlet-to-outlet separation distance by the formula:

$$\frac{d_2 - d_1}{2L} > \tan 7.5°,$$

d_2=diameter of the outlet channels
d_1=diameter of the inlet channels
L=distance between the inlets and outlets.

4,426,258
DRYING WOOD PULP IN THE PRESENCE OF AN ALKALI METAL SULPHITE

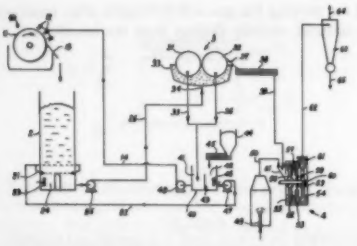
Thomas Browning, Nuneaton, England, assignor to Courtaulds Limited, London, England

Filed Mar. 2, 1982, Ser. No. 353,814

Claims priority, application United Kingdom, Mar. 6, 1981, 8107175

Int. Cl.³ D21C *3/04, 9/14, 9/18*; D21B *1/16*

U.S. Cl. 162—23 **8 Claims**



1. A process for producing a dried, bleached, short-fiber hard wood pulp which comprises bleaching at an acid pH a pulp derived from a hardwood, treating said bleached pulp which is at an acid pH due to residual acid remaining in the pulp from the bleaching process with an alkali metal sulphite, and drying said bleached pulp in a flash drier in the presence of said alkali metal sulphite, said alkali metal sulphite being present in an amount sufficient to reduce the formation of nodules of agglomerated wood pulp fibers in the dried pulp.

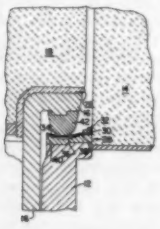
4,426,259
COKE OVEN DOOR SEAL

George Hendrych, Bethel Park, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed May 6, 1982, Ser. No. 375,380

Int. Cl.³ C10B *25/06, 25/16*

U.S. Cl. 202—248 **12 Claims**



1. In a coke oven in which interposed between heating flues there is an elongated horizontal chamber for coking coal and generating coke oven gases, said gases being maintained in said chamber at greater than atmospheric pressure and said chamber having at its opposite ends first and second openings for pushing coke, which openings, respectively, are peripherally surrounded by first and second door jambs and are respectively closeable by first and second doors having peripheral door frames alignable and engageable in juxtaposed relation with said door jambs, wherein the improvement comprises:

(a) a continuous annulus shaped leaf spring seat structure peripherally mounted on the frame of said first door and having a continuous medial recessed surface interposed between raised inner and outer surfaces;

(b) a flexible continuous annulus shaped leaf spring superimposed over said leaf spring seat structure and fixed at its inner edge to said raised inner surface and moveably abutting said raised outer surface said leaf spring having a elastic limit which would not be reached as a result of deflecting said leaf spring toward the medial recessed surface of the leaf spring seat structure to such an extent that the leaf spring abuts said medial recessed surface; and

(c) a continuous ridge structure projecting endwise from said first door jamb to medially flex said leaf spring by an amount which is less than that deflection which would result from exceeding the elastic limit of the leaf spring but which is more than the deflection which would allow gas pressure inside the oven to separate the leaf spring from the ridge structure and allow the escape of coke oven gases, such that a continuous, repeatedly reformable peripheral gas tight seal is formed around the first door.

4,426,260
PREPARATION OF ALUMINUM ELECTROLYTIC CAPACITOR FOIL

James L. Stevens, Irmo, S.C., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 6, 1982, Ser. No. 405,668

Int. Cl.³ C25D *5/44, 5/50, 11/08*

U.S. Cl. 204—33 **7 Claims**

1. A method of treating aluminum foil of an iron content of greater than about 0.010% by weight for use in electrolytic capacitors so as to reduce the leakage current of said capacitors, while maintaining the capacitance of said capacitors, said method consisting essentially of

a. electrolytically etching aluminum foil of an iron content of greater than about 0.010% by weight,

b. heating said etched aluminum foil at a temperature of 100° C. to 600° C. for about 10 seconds to 20 minutes,

c. treating said aluminum foil with 5–40% nitric acid at a temperature of 25° C. to 95° C. for a period of 10 seconds to 30 minutes, said treatment with nitric acid being carried out at a temperature and for a length of time at least sufficient to cause a reduction in the leakage current of said capacitors and being the sole mineral acid treatment of said electrolytically etched foil,

d. rinsing said aluminum foil with water and drying said aluminum foil and

e. electroforming said aluminum foil to thereby oxidize the surfaces thereof.

4,426,261
METHOD FOR SEPARATING DRINKING WATER

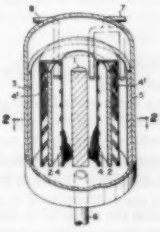
Tomotsuru Fushihara, 2-12, Hazawa, Nerima-ku, Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 332,756

Claims priority, application Japan, Dec. 23, 1980, 55-185431[U]

Int. Cl.³ C25B *1/16, 1/22, 9/00*; C02C *5/12*

U.S. Cl. 204—98 **2 Claims**



1. A method for separating drinking water into acidic and alkaline components comprising:

introducing water into an electrolytic cell having,

a centrally located column-like negative electrode;

an annular positive electrode positioned around said negative column-like electrode;

an annular negative electrode positioned around said annular positive electrode;

a membrane generally U-shaped in cross-section having two concentric side walls and a top wall extending therebetween, said membrane enclosing said positive electrode with one of said side walls being arranged between said positive electrode and said column-like negative electrode and the other of said side walls being arranged between said positive electrode and said annular negative electrode forming an annular volume surrounding said positive electrode, an inner annular space between said membrane and said column-like negative electrode, and an outer annular space between said membrane and said annular negative electrode;

removing acidic water from said annular volume; and

removing alkaline water from said inner and outer annular spaces.

4,426,262

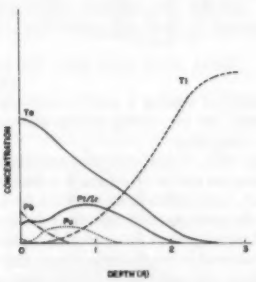
PROMOTION OF PT-IR CATALYTIC ELECTRODES WITH LEAD, TANTALUM, RUTHENIUM AND OXYGEN

Robert C. Langley, Millington, and Herbert Myers, South Orange, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Apr. 29, 1982, Ser. No. 372,906

Int. Cl.³ C25B *1/34*

U.S. Cl. 204—98 **14 Claims**



8. A method of electrolyzing an aqueous halide salt solution, comprising passing an electrolysis current through the halide salt solution between an anode and a cathode, said anode comprising a valve metal substrate having a catalytic layer thereon, the catalytic layer having a platinum-iridium rich zone adjacent the valve metal substrate and a lead-ruthenium valve metal oxygen rich zone upon the platinum-iridium rich zone.

4,426,263

METHOD AND ELECTROCATALYST FOR MAKING CHLORINE DIOXIDE

Kenneth L. Hardee, Middlefield; Arnold Z. Gordon, Lyndhurst; Charles B. Pyle, Chardon, and Rajat K. Sen, Cleveland Heights, all of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 256,968, Apr. 23, 1981. This application Feb. 1, 1982, Ser. No. 344,305

Int. Cl.³ C25B *1/26*

U.S. Cl. 204—101 **9 Claims**

6. An electrochemical process for generating chlorine dioxide in a reaction zone equipped with both an anodic electrode and a cathodic electrode comprising:

(i) filling said cell between said electrodes with an aqueous feedstock containing a strong acid and a chlorate of alkali metal or alkaline earth metal;

(ii) providing in contact with said cathodic electrode a catalyst comprising a mixture of platinum group metal oxides selected from the group consisting of ruthenium-rhodium, ruthenium-palladium, rhodium-palladium, iridium-rhodium, iridium-platinum and ruthenium-rhodium-palladium, each constituent of the mixture being present in a mole ratio of not less than 0.01;

(iii) passing a current between the two electrodes thereby forming chlorine dioxide at said cathodic electrode and surrounding catalyst; and

(iv) stripping and recovering chlorine dioxide from said reaction zone.

4,426,264

METHOD AND MEANS FOR CONTROLLING SPUTTERING APPARATUS

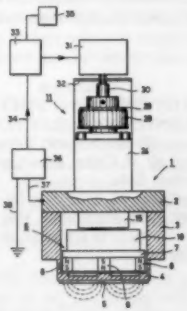
Wolf-Dieter Münz, Freigericht, and Hans Wolf, Erlensee, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,367

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047113

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 R **2 Claims**



1. In a sputtering apparatus having a target plate from one side of which material is to be sputtered, magnetic means on the other side of the target plate for providing at least some lines of magnetic force which pass from and re-enter the one side of the target plate, and positioning means relatively spacing the target plate and the magnetic means for varying the magnetic force passing from and re-entering the one side of the target plate, a method of maintaining substantially constant sputtering parameters, comprising:

obtaining a voltage value proportional to the sputtering voltage;

comparing the obtained voltage value with a nominal voltage value for determining the algebraic sign of any voltage deviation therebetween; and

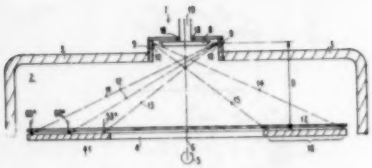
operating the positioning means in response to the determined deviation for spacing the target plate and magnetic means relatively such that the determined deviation is reduced.

4,426,265

METHOD OF PRODUCING A METALLIC THIN FILM MAGNETIC DISK

Arwed Brunsch, Stuttgart; Wolf-Dieter Ruh, and Gerhard Trippel, both of Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,736
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114740
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 M 4 Claims



1. A method of producing a metallic magnetic thin film recording surface on a metallic substrate comprising the steps of

sputtering an underlayer of Cr on said substrate as said substrate rotates,

sputtering a metallic magnetic layer of Cr, Co and Fe on said Cr underlayer of said rotating substrate, said underlayer and said magnetic layer being sputter deposited at an angle between 50° and 75° obliquely to the substrate normal; and

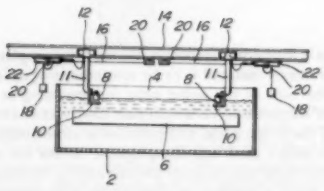
selectively shielding different portions of said rotating substrate from said sputtered material during sputtering of both said Cr underlayer and said Co Cr Fe magnetic layer to produce a magnetic recording surface of uniform thickness.

4,426,266

STRIP EDGE OVERCOATING PREVENTING DEVICE FOR CONTINUOUS ELECTROPLATING

Toshimichi Ukena; Hiroshi Narumi; Takao Shimizu, and Atsushi Nagashima, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed May 10, 1983, Ser. No. 493,418
Claims priority, application Japan, Feb. 28, 1983, 58-32502
Int. Cl.³ C25D *17/00*
U.S. Cl. 204—206 11 Claims



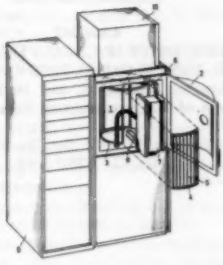
1. A device for preventing edges of a strip from being excessively plated in a continuous electroplating apparatus whose anodes are arranged in opposition to said continuously moving strip and immersed in a plating bath at its bottom, said device comprising trolleys arranged above said plating bath and movable in transverse directions of said strip, guide rollers rotatably secured to lower ends of levers depending from said trolleys, respectively, and rotated by and in contact with said edges of the strip by urging means, and shielding plates secured to said lower ends of said levers below said guide rollers so as to shield undersides of said edges of the strip from said anodes.

4,426,267

PROCESS AND APPARATUS FOR THE COATING OF SHAPED ARTICLES BY CATHODE SPUTTERING

Wolf D. Münz, Somborn, and Gerhard Hessberger, Karlstein, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 24, 1982, Ser. No. 351,730
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107914
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R 2 Claims



1. A method of coating a part by cathodic atomization of target material, the part having a three-dimensional surface to be coated, comprising:

providing two, facing cathodic atomization devices for receiving the part to be coated in a discharge space therebetween, each cathodic atomization device having a target of the same material delimiting the discharge space, a cathode arrangement for producing a plasma cloud of the target material in the discharge space, and magnetic means producing a magnetic field which closes on the target for concentrating the plasma cloud of the target material in a zone at the target surface delimiting the discharge space; and

applying a voltage which is negative with respect to ground to the part to be coated in the discharge space sufficient to cause the plasma clouds of the target material from the cathodic atomization devices at least to touch each other at the part to be coated in the discharge space.

4,426,268

METHOD FOR FORMING HIGH SUPERCONDUCTING T_c NIOBIUM NITRIDE FILM AT AMBIENT TEMPERATURES

Edward J. Cukauskas, Vienna, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 12, 1983, Ser. No. 513,195
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 C 9 Claims

1. A method for forming a high T_c niobium nitride film comprising the steps of:

maintaining a substrate at ambient temperature;

sputter depositing a niobium nitride (NbN) film from a niobium target cathode onto said substrate and introducing carbon into said NbN film.

4,426,269

METHOD OF STABILIZING ELECTRODES COATED WITH MIXED OXIDE ELECTROCATALYSTS DURING USE IN ELECTROCHEMICAL CELLS

David E. Brown, Weybridge, and Mahmood N. Mahmood, Walton-on-Thames, both of England, assignors to The British Petroleum Company Limited, London, England

PCT No. PCT/GB79/00040, § 371 Date Oct. 22, 1979, § 102(e) Date Oct. 22, 1979, PCT Pub. No. WO79/00709, PCT Pub. Date Sep. 20, 1979

PCT Filed Mar. 5, 1979, Ser. No. 170,668

Claims priority, application United Kingdom, Mar. 4, 1978, 8663/78; Jul. 19, 1978, 30415/78; Jul. 19, 1978, 30415/78; Sep. 6, 1978, 35770/78

Int. Cl.³ C25B *11/04*

U.S. Cl. 204—242 9 Claims

1. An electrochemical cell comprising: (i) an electrode having an electrocatalyst composition on a surface of the electrode, said electrocatalyst comprising a mixed oxide of nickel-molybdenum, nickel-tungsten, cobalt-molybdenum or cobalt-tungsten, and (ii) an electrolyte composition comprising an alkaline aqueous solution of a molybdenum, vanadium or tungsten compound.

4,426,270

MONOPOLAR FILTER-PRESS ELECTROLYZER

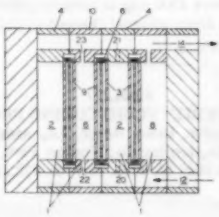
Helmut Schmitt, Dortmund; Helmuth Schurig, Holzwickede, and Bernd Strasser, Hamm/Westf., all of Fed. Rep. of Germany, assignors to UHDE GmbH, Dortmund, Fed. Rep. of Germany

Filed Jul. 27, 1982, Ser. No. 402,313

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1981, 3130806

Int. Cl.³ C25B *9/00, 15/08, 11/03*

U.S. Cl. 204—257 1 Claim



1. A monopolar filter-press electrolyzer for the production of an aqueous alkali hydroxide solution, halogen and hydrogen from an aqueous halogenide-bearing electrolyte, the electrolyzer including two end plates connected by tie-bars, a plurality of conductive electrode plates, electrolyte chambers, intermediate membranes, inlet and outlet ducts for the process fluids and the necessary gaskets; the improvement comprising: a plurality of external, non-conductive frame members positioned between the two end plates and adapted to support a separate electrode plate and membrane assembly between adjacent ones of said frame members, said electrode plate and membrane assembly including a pair of spaced apart electrode plates having an intermediate membrane positioned therebetween, each of said electrode plates having an internal portion permeable to gas and liquid and an integral outer peripheral portion impermeable to gas and liquid, said outer peripheral portion having a laterally extending electrical buss, and means for maintaining said plates and said membrane is spaced apart relationship, each of said frame members provided with means for supporting said electrode plate and membrane assembly between adjacent ones of said frame members, said supporting means including a recessed portion formed in at least one side of one of said frame members for receiving and sealingly engaging the outer peripheral portion of said electrode plate located on one side of said electrode plate and membrane assembly, while the adjacent frame member sealingly engages the outer peripheral portion of said electrode plate located on the opposite side of sai,d electrode plate and membrane assembly, each of said frame members having an internal chamber formed therein which cooperates with the electrode plate and membrane assembly positioned adjacent thereto for defining one of the electrolyte chambers, said frame members provided with passages for the flow of the process fluids between the electrolyte chambers and the inlet and outlet ducts.

4,426,271

HOMOGENEOUS CATION EXCHANGE MEMBRANE HAVING A MULTI-LAYER STRUCTURE

Mitsuo Yoshida; Yoshinori Masuda, and Akio Kashiwada, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

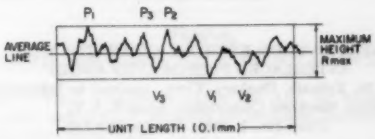
Filed Apr. 9, 1981, Ser. No. 252,280

Claims priority, application Japan, Apr. 15, 1980, 55-48633; Aug. 15, 1980, 55-111810

The portion of the term of this patent subsequent to Apr. 6, 1999, has been disclaimed.

Int. Cl.³ C25F *1/34, 13/02*

U.S. Cl. 204—296 13 Claims



1. A cation exchange membrane having a multi-layer structure consisting essentially of two or more layers each having a different equivalent weight and/or a different kind of ion exchange group, wherein at least the outer layer of said membrane having the lower water content of both outer layers of said membrane has a surface which is roughened to thereby prevent the adhesion of gas bubbles to the surface thereof during electrolysis.

4,426,272

ELECTROLYTIC CELL VERMICULITE DIAPHRAGMS

Richard A. Hanmer, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 182,914, Sep. 2, 1980, abandoned. This application May 10, 1982, Ser. No. 376,153

Int. Cl.³ C25B *13/00*

U.S. Cl. 204—296 18 Claims

1. A semi-permeable material for use as a hydraulically-permeable diaphragm in an electrolytic cell, said material consisting essentially of a contiguous sheet of pulverized expanded vermiculite deposited on a foraminous cathode.

4,426,273

WORKHOLDER AND CARRIER FOR ELECTRODEPOSITION SYSTEM

Valerie M. Rousseau, Dudley, Mass., assignor to Wright Line Inc., Worcester, Mass.

Filed Aug. 4, 1981, Ser. No. 289,937

Int. Cl.³ C25D *7/00*

U.S. Cl. 204—297 W 15 Claims

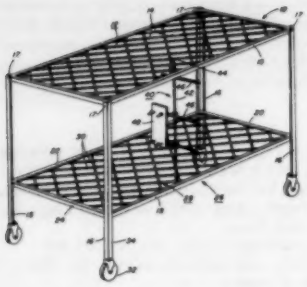
1. In combination:

a cage having a top surface including a plurality of metallic rods;

a cane-like structure having a shank portion, and a hook portion connected to said shank portion, said hook portion disposable over at least one of said rods;

a plurality of cross beams disposable perpendicular to said shank portion and connectable thereto; and

at least one spring clip having a posterior end connectable to one of said cross beams and a distal end connected to said



posterior end, said distal end being in the form of a distortable spring means for securing thereon an article of manufacture.

4,426,274

REACTIVE ION ETCHING APPARATUS WITH INTERLACED PERFORATED ANODE

Linda M. Ephrath, Danbury, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 2, 1981, Ser. No. 269,160
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **34 Claims**

1. Reactive ion etching apparatus comprising

a cathode,

an anode having a plurality of perforations therein disposed in spaced relationship with said cathode, and,

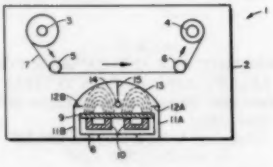
means disposed in contiguous relationship with said anode for controlling the etch rate of said apparatus to provide a substantially uniform etch rate of materials contacting said cathode.

4,426,275

SPUTTERING DEVICE ADAPTABLE FOR COATING HEAT-SENSITIVE SUBSTRATES

Benjamin B. Meckel, Del Mar, and Nathan K. Meckel, LaMesa, both of Calif., assignors to Deposition Technology, Inc., San Diego, Calif.

Filed Nov. 27, 1981, Ser. No. 325,143
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **22 Claims**



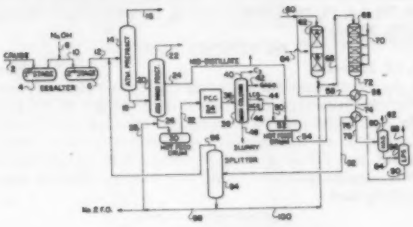
1. In a sputtering device adaptable for coating heat-sensitive substrates, said device including a target member and means for forming a magnetic field which projects outwardly from a surface portion of said target member and generally towards a substrate, the improvement comprising means responsive to said magnetic field for confining heated plasma proximate said surface portion of said target member.

4,426,276

COMBINED FLUID CATALYTIC CRACKING AND HYDROCRACKING PROCESS

Robert R. Dean, #1 Columbine La., Littleton, Colo. 80123, and Jean-Louis Mauleon, 15656 E. Grand Ave., Aurora, Colo. 80015

Continuation of Ser. No. 359,154, Mar. 17, 1982, abandoned. This application Apr. 20, 1983, Ser. No. 486,802
Int. Cl.³ C10G *69/02, 69/04, 69/06*
U.S. Cl. 208—60 **20 Claims**



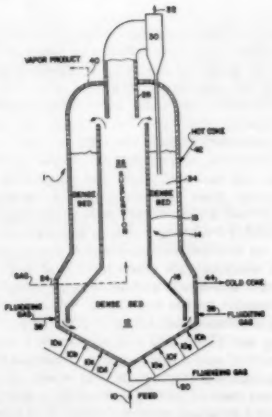
1. A method for converting a reduced crude oil comprising multicyclic ring compounds boiling above 1025° F. which comprises, converting a 600° F. plus fraction of a reduced crude oil comprising sulfur, nitrogen, and metal contaminants in admixture with a hydrogen donor material of hydrocracking boiling above 400° F. to 600° F. with a fluid zeolite cracking catalyst at an elevated temperature sufficient to effect conversion of the mixed oil feed within the range of 50–85 vol. % producing light and heavy cycle oils, hydrotreating and hydrocracking said cycle oil products at a temperature below 800° F. and a pressure above 1500 psig to produce gasoline and higher boiling hydrogen donor material charged to said fluid catalytic cracking operation.

4,426,277

LOW SEVERITY FLUID COKING PROCESS

William J. Metrailer, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 14, 1982, Ser. No. 378,211
Int. Cl.³ C10G *9/32*
U.S. Cl. 208—127 **7 Claims**



1. A fluid coking process which comprises:

(a) introducing a carbonaceous chargestock into a first fluid-

ized bed coking zone containing a bed of fluidized solids maintained at fluid coking conditions, including a temperature ranging from about 850° to about 1400° F. and a pressure ranging from about 0 to about 150 psig, to form coke, said coke depositing on said fluidized solids, and a vapor phase product;

(b) passing said vapor phase product and entrained solids into a second coking zone maintained at a temperature ranging from about 850° to about 1400° F. and a pressure ranging from about 0 to about 150 psig, said second coking zone being an elongated zone having a smaller internal diameter than said first coking zone, to form a suspension of said entrained solids in said vapor phase product and to increase the velocity of said suspension;

(c) reacting said suspension in said second coking zone for a residence time ranging from about 0.5 to about 7 seconds;

(d) separating a major portion of said solids from said suspension;

(e) passing the resulting separated solids comprising adherent hydrocarbons to a third fluidized bed coking zone maintained at a pressure ranging from about 0 to about 150 psig and a temperature at least about 25 Fahrenheit degrees higher than the operating temperature of said first fluidized bed coking zone, and

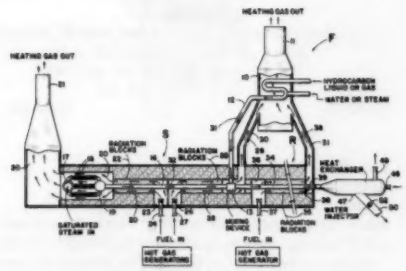
(f) cracking at least a portion of said adherent hydrocarbons in said third coking zone.

4,426,278

PROCESS AND APPARATUS FOR THERMALLY CRACKING HYDROCARBONS

Peter H. Kosters, Magrette, Netherlands, assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 4, 1982, Ser. No. 405,212
Int. Cl.³ C10G *9/14, 9/36;* C07C *4/04*
U.S. Cl. 208—130 **7 Claims**



1. A process for cracking a hydrocarbon composition which comprises the steps of:

passing steam through a conduit enclosed by a radiation block structure, the structure defining a gas passage which surrounds the steam conduit;

flowing heating gases through the gas passage to superheat the steam to a temperature of from about 1000° C. to 1500° C.;

mixing the hydrocarbon composition with the superheated steam;

passing the resulting hydrocarbon-steam mixture through a reactor conduit which extends through and is enclosed by a radiation block structure, the structure defining a gas passage which surrounds the reactor conduit;

flowing heating gases through the gas passage, in contact with the reactor conduit, and in a direction co-current with the flow of the hydrocarbon-steam mixture through said reactor conduit, to heat said hydrocarbon-steam mixture to a temperature of from about 700° C. to 1000° C.;

causing the heated hydrocarbon composition to undergo a cracking reaction while in the reactor conduit; and

passing the hot reaction product from the reactor conduit into a heat exchanger for quenching said reaction product.

4,426,279

REFORMING HYDROCARBONS WITH A PLATINUM GROUP- AND PHOSPHORUS-CONTAINING CATALYST

George J. Antos, Bartlett, and Tai-Hsiang Chao, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 324,302, Nov. 23, 1981, Pat. No. 4,367,137, which is a continuation of Ser. No. 212,780, Dec. 4, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 426,015
The portion of the term of this patent subsequent to Jan. 4, 1999, has been disclaimed.
Int. Cl.³ C10G *35/085*
U.S. Cl. 208—138 **5 Claims**

1. A process for reforming hydrocarbons which comprises contacting the hydrocarbons at reforming conditions with a catalyst made by contacting a composite comprising a platinum group component and a porous support material with phosphorus or a compound of phosphorus to incorporate the phosphorous component.

4,426,280

PROCESS FOR REMOVING NITROGEN FROM SHALE OIL

Paul Y. Chen, Huntington Beach, and Ajay M. Madgavkar, Irvine, both of Calif., assignors to Occidental Petroleum Corporation, Irvine, Calif.

Filed Feb. 9, 1982, Ser. No. 347,095
Int. Cl.³ C10G *17/04*
U.S. Cl. 208—254 R **47 Claims**

32. A process for removal of nitrogen-containing compounds from oil, comprising:

countercurrently contacting oil with a solvent for nitrogen-containing compounds, said solvent comprising an aqueous liquid substantially immiscible with the oil and an acidic component dissolved in the liquid, the solvent characterized by having a greater selectivity for nitrogen-containing compounds at a relatively lower concentration of such component and a smaller selectivity for nitrogen-containing compounds at a relatively higher concentration of such component, for a time sufficient for the solvent to extract nitrogen-containing compounds and non-nitrogen-containing compounds from the oil; and

diluting the solvent with such substantially immiscible aqueous liquid between initial contact between the oil and the solvent and final contact between the oil and the solvent, said dilution resulting in the selective retention of nitrogen-containing compounds by the diluted solvent and the selective partition of non-nitrogen-containing compounds from the diluted solvent into the oil.

4,426,281

FLOAT/SINK TREATMENT OF CRUSHED COAL IN SOLUTIONS OF MONOSACCHARIDES AND DISACCHARIDES

Robert A. Meyers, Tarzana, and Walter D. Hart, Upland, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 144,154, Apr. 28, 1980. This application Sep. 21, 1981, Ser. No. 303,740
Int. Cl.³ B03B *5/44*
U.S. Cl. 209—11 **13 Claims**

1. A method comprising subjecting crushed coal having sizes no larger than about 14 mesh and comprising up to about 60% ash by weight, up to about 5% sulfur by weight, or both, to the gravitational forces of a cyclone using an aqueous media having a specific gravity in the range of about 1.3 to about 1.4 which incluces at least one substance selected from the group consisting of monosaccharides, disaccharides, hydrogenated

monosaccharides, hydrogenated disaccharides and mixtures thereof, and recovering from said cyclone a float coal having substantially lower ash content, sulfur content, or both.

4,426,282

PROCESS FOR THE SEPARATION OF COAL PARTICLES FROM FLY ASH BY FLOTATION

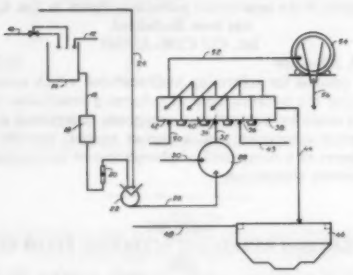
Knud E. H. Aunsholt, Roskilde, Denmark, assignor to Kryolitselskabet Oresund A/S, Copenhagen, Denmark

Filed Feb. 11, 1982, Ser. No. 348,102

Claims priority, application Denmark, Feb. 16, 1981, 664/81

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—167 **12 Claims**



1. In a process for the separation of coal particles from fly ash by flotation in water containing at least one collector and at least one frother, whereby a comparatively pure coal fraction is obtained as a top froth fraction, and a substantially non-carbonaceous ash fraction is obtained as a bottom depressed fraction, the improvement of carrying out said flotation under vigorous aeration in at least two steps, the froth of the first step forming a substantial part of the feed of the last step, in which the pH is adjusted to a pH of 6 to 8 in the first step and to a pH of 3 to 6.5 in the last step, and in which the pH is lower in the last step than in the first step.

4,426,283

MONO HYDROCYCLONE SEPARATOR

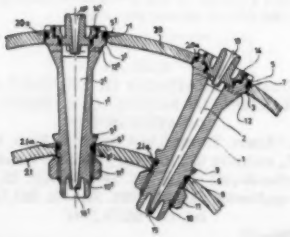
Aurel J. Fecske, Huddinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Jan. 11, 1982, Ser. No. 338,560

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116873

Int. Cl.³ B04C *5/4*

U.S. Cl. 209—211 **5 Claims**



1. A mono hydrocyclone for separating a mixture and comprising a body containing a separation chamber, said body having first and second ends provided with first and second cylindrical external parts, respectively, said body also having a tangential inlet to said chamber, a third part screwed into said first end and forming an axial outlet from the chamber for discharging a light separated component of said mixture, said second end forming a second axial outlet from the chamber, each of said cylindrical external parts having a ring groove extending around the part, a sealing ring in each of said grooves, said body having a collar adjacent the side of said second cylindrical part which is nearer the first cylindrical part, the diameter of said collar increasing toward said first cylindrical part, said second end of the body having an external thread adjacent the side of said second cylindrical part which is remote from the first cylindrical part, and a nut screwed onto said thread, a pair of concentric standpipes spaced from each other and having respective holes which are aligned with each other to receive said body, said first cylindrical part being located in one of said holes which is of substantially larger diameter than the other hole, said second cylindrical part being located in said other hole with the corresponding standpipe clamped between said collar and nut, said holes being defined by annular walls engaging said sealing rings, respectively.

4,426,284

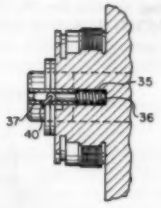
FILTER CONDITION INDICATOR

Samuel S. Mitchell, Monroeville, and Abbas F. Vijlee, Pittsburgh, both of Pa., assignors to Schroeder Brothers Corporation, McKees Rocks, Pa.

Filed Feb. 3, 1983, Ser. No. 463,499

Int. Cl.³ B01D *27/10*

U.S. Cl. 210—90 **2 Claims**



1. A filter comprising

a filter head;

a canister secured to the filter head;

means for securing a tubular filter within the canister;

said filter head comprising inlet and outlet ports for connecting into a hydraulic conduit, a first passage for normally delivering fluid from the inlet port to the outer cylindrical surface of the tubular filter element and a second passage for delivering fluid from the interior of the filter element to the outlet port;

said filter head having a sliding element in between the inlet and outlet ports, said element being spring biased which bias can be overcome by differential pressure across the filter element;

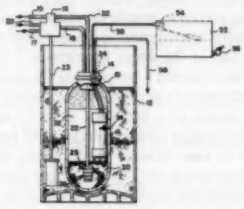
means associated with said sliding element and extending through the filter head to the exterior thereof for indicating the position thereof;

said filter head having a butterfly valve in said second passage, plunger means slidably positioned in said filter head being spring biased to a first position in which it extends into the canister in the space normally occupied by the tubular filter element, a linkage between the butterfly valve and the plunger means to close the valve when the plunger is in its first position, and to open the valve when the plunger is forced in a second position by normal placement of a filter element.

4,426,285
WATER SOFTENING AND TREATMENT SYSTEM

Stephen H. Davis, Middletown, Ohio, assignor to Water Refining Company, Middleton, Ohio

Filed Jun. 28, 1982, Ser. No. 392,826
The portion of the term of this patent subsequent to Sep. 15, 1998, has been disclaimed.
Int. Cl.[1] B01D 57/00
U.S. Cl. 210—109 9 Claims

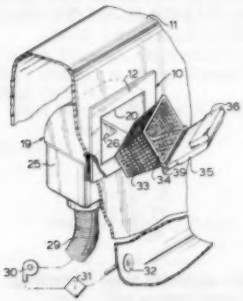


1. A water softening and treatment system comprising:
a pressure tank;
an inlet line for conveying raw water to said pressure tank;
an outlet line for conveying softening water from said tank;
a quantity of particulate treatment material located within said pressure tank for softening raw water within said tank;
at least one semi-permeable reverse osmosis membrane element means, positioned within said pressure tank, for filtering water; and
means for collecting treated water from said membrane element means.

4,426,286
SKIMMER

Joe D. Puckett, Benton, and Donald L. Bryant, Bryant, both of Ark., assignors to Jacuzzi Inc., Little Rock, Ark.

Filed Dec. 16, 1981, Ser. No. 331,270
Int. Cl.[3] E04H 3/20
U.S. Cl. 210—121 22 Claims

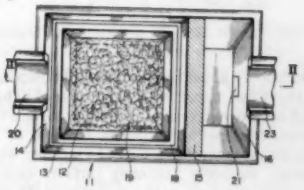


1. A skimming device arranged to be received within a wall of an enclosure for a body of water comprising:
a housing including a horizontal inlet portion having an opening therein arranged to be positioned in open communication with said body of water,
said housing having a downwardly extending vertical discharge chamber with an opening of lesser cross-sectional area than said opening of said horizontal inlet portion,
a foraminous strainer basket proportioned to be received through said opening and arranged to be seated in said vertical discharge chamber, and
a float pivotally secured to said strainer basket and also proportioned to be received through said opening and being sufficiently large to overlie completely said opening to said vertical discharge chamber,
said float being proportioned to be freely insertable in and withdrawable from said horizontal inlet,
said strainer basket and said float being removable as a unit from within said housing.

4,426,287
MOLTEN METAL FILTERING DEVICE

Tsuneaki Narumiya, Yokohama, Japan, assignor to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 332,094
Claims priority, application Japan, Dec. 27, 1980, 55-190374[U]
Int. Cl.[3] B01D 23/02
U.S. Cl. 210—184 6 Claims



1. A molten metal filtering device for a molten metal comprising:
a filter housing provided in a flow path for molten metal;
a horizontal partition disposed within said filter housing and having at least one filter frame-setting hole therethrough;
a filter frame detachably fitted to said filter frame-setting hole, including a filter medium-receiving hole therethrough and including an upper portion which protrudes from said filter frame-setting hole to provide a holding means for being grasped to permit easy removal and replacement of said filter frame; and
a filter medium in the shape of a substantially flat plate positioned within said filter medium-receiving hole of said filter frame at a level such that the upper surface of said filter medium is below said holding means defined by the protruding upper portion of said filter frame and is below an inflow path and an overflow path of said molten metal for maintaining said filter medium and filter frame immersed in molten metal when said filtering device is not in operation, and wherein said filter medium immersed in molten metal is exchanged by grasping said holding means and removing and replacing said filter frame and filter medium without removing molten metal from said filter housing.

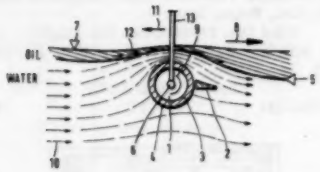
4,426,288
METHOD AND APPARATUS FOR CONVEYING AND DAMMING BACK LIGHTER LIQUIDS FLOATING ON SPECIFICALLY HEAVIER LIQUIDS, PARTICULARLY OIL FLOATING ON WATER

Harm-Hinrich Münte, Reinbek-Neuschönningstedt, Fed. Rep. of Germany, assignor to Jastram-Werke GmbH & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,824
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 8032677[U]; Oct. 13, 1981, 8129821[U]
Int. Cl.[3] E02B 15/04
U.S. Cl. 210—242.3 12 Claims

1. An apparatus for conveying and damming back a layer of lighter liquid floating on a body of a specifically heavier liquid

such as a layer of oil floating on a body of water, with the body of the heavier liquid forming an interface with the layer of the lighter liquid, comprising means positionable within the body of heavier liquid adjacent the interface between the lighter and heavier liquids for affecting an overspeed of the combined liquids flowing between said means and the surface of the lighter liquid relative to the normal flow speed of the combined liquids for transferring shear or thrust forces into the layer of lighter liquid, and said means including an upper surface adjacent to and spaced closely below the interface of the liquids for lifting and compacting the heavier liquid flowing over said upper surface so that downstream of said upper



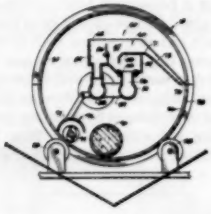
surface the heavier liquid has a downward component of flow whereby above said upper surface the layer of lighter liquid is compacted and downstream of said upper surface the layer of lighter liquid thickens for affording removal of the lighter liquid, said means comprises a weir-like member with a pair of approximately vertically extending surfaces each extending generally perpendicularly of the direction of the normal flow with one said vertically extending surface facing upstream and the other said vertically extending surface facing downstream relative to the normal flow direction with said upper surface located at the upper ends of and interconnecting said vertically extending surfaces.

4,426,289

ROTARY SCREEN LIQUID-SOLID SEPARATOR

Henry V. Svehaug, 114 SW. 5th St., Milton-Freewater, Oreg. 97862

Filed Aug. 3, 1981, Ser. No. 289,304
Int. Cl.³ B01D *33/10*
U.S. Cl. 210—403 **12 Claims**



1. A rotary screen separator for separating solids from a slurry of liquid and solids, comprising:

a frame;

a cylindrical screen means mounted on the frame for rotation about a substantially horizontal axis;

drive means operatively connected to the cylindrical screen means for rotating the cylindrical screen means about said axis;

said cylindrical screen means having a curved straining screen with a concave inner screen surface and a convex outer screen surface;

slurry feed means mounted within the interior of the cylindrical screen means;

said slurry feed means comprising:

(a) an expansion tank mounted within the interior of the cylindrical screen means for receiving the slurry;

(b) said expansion tank having a weir at a desired elevation with respect to the rotational axis for permitting the slurry to flow thereover in a curtain when the elevation of the slurry in the expansion tank exceeds the elevation of the weir;

(c) a spillway operatively connected to the weir for directing the slurry curtain radially outward and downward toward the screen to enable the slurry to accelerate to the desired slurry velocity and to decrease the thickness of the slurry curtain as the slurry accelerates;

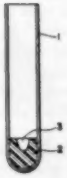
(d) said spillway having a terminating lip means adjacent the downward path of the inner screen surface of the moving straining screen at a sufficient velocity as the straining screen is moving in a curved downward path (1) to enable the liquid to pass through the straining screen from the inner screen surface to the outer screen surface to progressively separate the liquid from the solids as the cylindrical screen means rotates about the axis, and (2) to enable the flowing slurry curtain to push the solids forward along the inner screen surface in the curved downward path to facilitate the liquid/solid separation.

4,426,290

APPARATUS FOR SEPARATING BLOOD

Toshiji Ichikawa, Chofu; Teruko Watanabe, Tokyo, and Yoshimitsu Asada, Honmachi, all of Japan, assignors to Terumo Corporation, Tokyo, Japan

PCT No. PCT/JP80/00206, tion, Tokyo, Japan
Continuation of Ser. No. 259,027, Apr. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 184,084, Sep. 4, 1980, Pat. No. 4,310,430. This PCT application Sep. 11, 1980, Ser. No. 473,975
Claims priority, application Japan, May 8, 1980, 55-61013; May 26, 1980, 55-69913; Mar. 12, 1981, 56-34636
Int. Cl.³ B01D *21/26*; C09K *3/00*
U.S. Cl. 210—516 **25 Claims**



1. Apparatus for separating blood comprising:

a tube with a closed bottom end;

a thixotropic gel-like sealant having a specific gravity intermediate between the gravities of serum and clot phases of blood, said sealant being contained at the bottom end of said tube and having an upper surface spaced from the bottom of said tube; and

a cavity formed in said sealant when said tube is at rest, said cavity being intermediate the edges of said sealant and extending from said upper surface toward the bottom of said tube but not reaching the bottom of said tube, said cavity being formed by said sealant alone without any cavity maintaining members in said tube.

4,426,291

SOLVENT EXTRACTION OF NITRATED ORGANIC COMPOUNDS FROM AQUEOUS SOLUTIONS

Shrikishna G. Sharangpani, and Floyd G. Spence, both of Holland, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 23, 1981, Ser. No. 323,740
Int. Cl.³ B01D 11/04
U.S. Cl. 210—634 14 Claims

1. In a process for the preparation of amine dyes and pigments the improvement for the separation of a nitrated substance from a spent nitrating acid wherein said nitrated substance contains polar groups selected from the group consisting of $-SO_3H$, $-OH$, $-SH$, $-CO_2H$, $-OSO_3H$, and $-OP(OH)_2$ and their salts comprising

(1) adding an extracting agent selected from the group consisting of monohydric alcohols and ketones containing about 5 to 12 carbon atoms to said nitrating substance-spent acid solution,

(2) diluting the nitrated substance-spent acid solution with water, prior or subsequent to said addition of said extracting agent

(a) the concentration of water in said solution being such that said extracting agent is immiscible with said acid

(3) permitting the mixture to separate into layers of different densities with

(a) one of said layers comprising said nitrated substance dissolved in said extracting agent

(4) removing said nitrated substance-extracting agent layer and

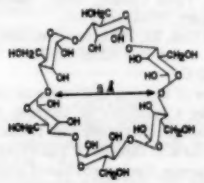
(5) separating the nitrated substance from said extracting agent layer.

4,426,292

PROCESS FOR SELECTIVE SEPARATION OF MOLECULAR SPECIES FROM MIXTURES THEREOF USING CYCLODEXTRINS

David L. Wernick, Elizabeth, and Stephen Scypinski, Garwood, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 19, 1982, Ser. No. 350,194
Int. Cl.³ B01D 15/08
U.S. Cl. 210—635 19 Claims



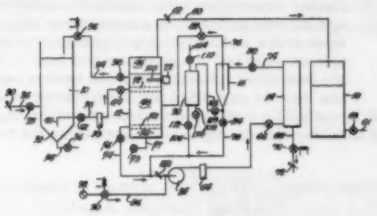
1. In a process for selectively separating two or more fluid molecular species from a mixture of the same wherein at least one molecular species is sorbed on a sorbent and the sorbed molecular species is then desorbed, thereby partially or fully regenerating the sorbent, the improvement which comprises employing as the sorbent an underivatized crystalline monomeric cyclodextrin containing 6–8 glucose units.

4,426,293

METHOD AND APPARATUS FOR REMOVING OIL FROM WATER

Donald G. Mason, Overland Park, Kans., and Frank G. Weis, Kansas City, Mo., assignors to Smith & Loveless, Inc., Lenexa, Kans.

Filed May 4, 1983, Ser. No. 491,588
Int. Cl.³ C02F 1/40; B01D 13/00, 31/00
U.S. Cl. 210—636 40 Claims



1. A method of separating oil from water, comprising the steps of: directing an oil and water mixture into a separation vessel to separate oil by gravity from the water; accumulating a layer of oil in an upper portion of the separation vessel and discharging the generally oil-free water from a lower portion of the separation vessel into a water transfer line; pumping the generally oil-free water in the water transfer line under pressure into an oil barrier vessel containing an ultrafine molecular filter; directing the generally oil free water through the ultrafine molecular filter; withdrawing the permeate liquid from the oil barrier vessel and directing it into a permeate liquid effluent line; withdrawing the concentrate liquid from the oil barrier vessel into a concentrate liquid effluent line; directing at least a portion of the concentrate liquid back into the separation vessel; periodically directing ejection water through an ejection water inlet line having a first control valve associated therewith into a lower portion of the separation vessel for discharging oil accumulated in the upper portion of the separation vessel through an oil effluent line; and sensing the level of the lower layer of the oil in the separation vessel so as to open the first control valve when the level reaches a predetermined lower level and to close the first control valve when the level reaches a predetermined upper level.

4. The method of claim 1 and further including the steps of periodically closing the first control valve and cycling a cleaning solution from a wash tank through the ultrafine molecular filter in the oil barrier vessel.

4,426,294

MICROCOMPUTER CONTROLLED DEMAND/SCHEDULED WATER SOFTENER

J. David Seal, Waukesha, Wis., assignor to Autotrol Corporation, Milwaukee, Wis.

Filed Aug. 27, 1982, Ser. No. 412,279
Int. Cl.³ B01J 49/00
U.S. Cl. 210—662 10 Claims

5. A control for a water softener which has a resin bed requiring periodic regeneration, comprising:

a flowmeter for measuring the volume of flow of soft water leaving the water softener;

a data input device for receiving information indicative of the total capacity of the water softener resin bed and indicative of the hardness of the water entering the water softener resin bed;

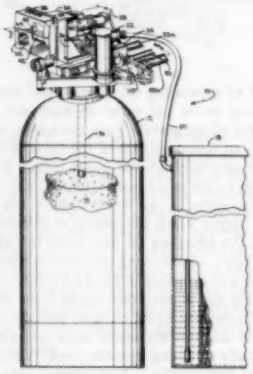
a controller for controlling the water softener to initiate regeneration said controller including,

a timer for measuring time;

a memory for storing data indicative of the quantity of soft water used over a period of days in accordance with the flow measured by said flowmeter; and

a central processor coupled to said timer and to said memory for determining each day the actual average daily quantity of soft water used over a period of several days and for establishing a soft water reserve value indicative of the amount of soft water likely to be used prior to the next possible regeneration in proportion to the determined actual average daily quantity of soft water used, said central processor being coupled to said data input device for determining the remaining resin bed capacity in accordance with the amount of soft water used since the last regeneration as determined from data stored in said memory and from data input entered through said input device, and for initiating regeneration of the water softener resin bed at a predetermined time each day if the determined remaining resin bed treating capacity is less than the established soft water reserve quantity.

6. A method for controlling a water softener having a resin bed requiring periodic regeneration comprising the steps of:



(a) measuring the quantity of soft water leaving the water softener for a given period of time;

(b) each day determining the actual average daily quantity of soft water used and determining the total amount of soft water used since the last regeneration from the measured amount of soft water used over a given period of time;

(c) establishing a reserve quantity of soft water as a proportion of the determined actual average daily quantity of soft water used;

(d) determining the remaining water softener resin bed treating capacity in accordance with the determined amount of soft water used since the last regeneration, the hardness of the incoming water and the total water softener resin bed treating capacity; and

(e) initiating water softener regeneration at a predetermined time if the determined remaining water softener resin bed treating capacity is less than the determined soft water reserve quantity.

4,426,295

CELL SUSPENSION CHAMBER PROCESS

Deborah A. Evans, 115 NW. 122 St., North Miami, Fla. 33168, and Lisbeth E. Shelley, 7805 Camino Real, Apt. H301, Miami, Fla. 33143

Filed Sep. 28, 1981, Ser. No. 306,494
Int. Cl.³ B01D *37/00*
U.S. Cl. 210—772 **18 Claims**

1. A process for concentrating cells present in serosanguineous body fluids comprising:

(a) introducing a sample of a serosanguineous body fluid, containing excess body fluid, into the elongated inner chamber of an apparatus comprising:

(1) a body comprising:

(i) an elongated inner chamber for receiving body fluids containing cells to be concentrated, said inner chamber being provided with an inlet opening at one end thereof through which body fluids can be introduced into said inner chamber, and an outlet opening at the opposite end of said inner chamber, and

(ii) an outer chamber disposed about said inner chamber in spaced relationship thereto to form a housing for said inner chamber;

(2) a cap portion removably engageable with said body portion at said outlet opening of said inner chamber, said cap portion having an opening therein communicating with said outlet opening of said inner chamber through which excess fluid within said inner chamber can be removed, and

(3) a filter, interposed between said opening in said cap portion and said outlet opening in said inner chamber of said body portion, for retaining cells within said inner

chamber while permitting excess fluid to be removed from said inner chamber, and permitting said excess body fluid to pass through said filter and be removed from said inner chamber, leaving a concentrated cell fluid in said inner chamber;

(b) adding a hemolytic solution to said concentrated cell fluid in said inner chamber;

(c) withdrawing and reintroducing the combined fluids from step (b) into said inner chamber at least once;

(d) adding a physiologic saline solution to said combined fluids in said inner chamber, and

(e) withdrawing and reintroducing into said inner chamber the combined fluids from step (d) at least once, during which process any cells on said filter are washed off into said combined fluids, the fluid remaining within said inner chamber being a concentrate solution of cells capable of being analyzed.

4,426,296

METHOD OF ACIDIZING WELLS USING GELLED ACIDS

Curtis W. Crowe, Tulsa County, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 13, 1981, Ser. No. 310,932
Int. Cl.³ E21B *43/27*
U.S. Cl. 252—8.55 C **14 Claims**

1. In the process of treating a siliceous or calcareous formation penetrated by a wellbore to increase the permeability thereof wherein said process comprises contacting said formation with an aqueous acid capable of dissolving mineral constituents of said formation, the improvement comprising using as said aqueous acid a composition comprising:

(a) aqueous hydrochloric acid,

(b) a readily soluble gelling agent which contains a gelling amount of polyoxyethylene glycol having an average molecular weight of at least about 250,000 and enough ammonium-, alkali-, or alkaline earth metal bicarbonate or carbonate to cause rapid dispersion and dissolution of said polyoxyethylene glycol in (a), and

(c) a compatible iron control agent dissolved therein,

wherein said agent is ascorbic acid, erythorbic acid and/or a soluble salt thereof.

4,426,297

DIESTER COMPOSITION AND TEXTILE PROCESSING COMPOSITIONS THEREFROM

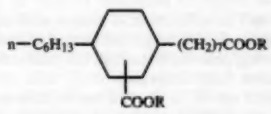
Robert B. Wilson, Greenville, S.C., assignor to Crucible Chemical Company, Greenville, S.C.

Continuation of Ser. No. 259,924, May 4, 1981, abandoned, which is a continuation-in-part of Ser. No. 90,092, Nov. 1, 1979, abandoned. This application May 10, 1982, Ser. No. 376,748
The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.
Int. Cl.³ D06M *1/00*
U.S. Cl. 252—8.6 24 Claims

CONVENTIONAL SPIN FINISH
(100X)

1. A synthetic fiber of fabric coated with a textile-treating composition having one or more emulsifiers, dispersing agents and/or anti static agents and containing:

(a) a cycloaliphatic diester of the formula



wherein R is a straight or branched chain alkyl of 4–20 carbon atoms, polyoxyalkylene of the formula $HO(CH_2CH_2O)_nCH_2CH_2$—, $HO(C_3H_6O)_nC_3H_6$—, $HO(CH_2CH_2O)_p(C_3H_6O)_qC_3H_6$—, or $HO(C_3H_6O)_p(C_2H_4O)_qC_2H_4$— or phosphated polyoxyalkylene, wherein n is 2–22 and the sum of p+q is n; and

(b) a high boiling aromatic ester of the formula $ArCOO—R_1—OOCAr$ or $ArCOOR_2$, wherein Ar is a substituted or unsubstituted aryl; R_1 is alkylene of 2–8 carbon atoms or polyoxyalkylene of the formula $—C_rH_{2r}(O—C_rH_{2r})_s—$ in which r is 2 or 3 and s is up to 15; and R_2 is alkyl or alkenyl of 8–30 carbon atoms;

wherein the combination of cycloaliphatic diester and high boiling aromatic ester constitutes 10–90% by weight of the textile treating composition.

4,426,298

TEXTILE PROCESSING OILS

John D. Shepley, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 24, 1982, Ser. No. 444,141
Claims priority, application United Kingdom, Nov. 27, 1981, 8135819
Int. Cl.³ D06M *13/18*
U.S. Cl. 252—8.9 9 Claims

1. A composition useful in the processing of textiles, which comprises

(a) between about 50 and 88 parts by weight of a mixture of alcohol ethoxylates of the formula $C_nH_{2n+1}—O—CH_2—CH_2—_mOH$ wherein n is in the range from 9 to 11 inclusive and m has an average value in the range from 5 to 7 inclusive,

(b) between about 12 and 32 parts by weight of a mixture of alcohol propoxylates of the formula $C_pH_{2p+1}—O—CH(CH_3)—CH_2—_qOH$ wherein p is in the range from 12 to 15 inclusive and q has an average value in the range from 5 to 6 inclusive, and

(c) between 0 and about 28 parts by weight of a copoly(ethoxylate propoxylate) mono C_1 to C_6 alkyl ether having an ethoxylate to propoxylate weight ratio between 30 to 70 and 5 to 95, the sum of the individual parts by weight of (a), (b), and (c) totaling 100.

4,426,299

CONCENTRATED FABRIC SOFTENING COMPOSITION

Martin W. Verbruggen, Humbeek, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 110,144, Jan. 7, 1980, abandoned. This application Oct. 6, 1981, Ser. No. 309,330
Claims priority, application United Kingdom, Jan. 11, 1979, 7901137
Int. Cl.³ D06M *13/20, 13/46*
U.S. Cl. 252—8.8 8 Claims

1. A fabric softening composition in the form of an aqueous dispersion comprising

(a) from 8% to 22% of a water-insoluble cationic fabric softener and

(b) from 0.5% to 4% of a viscosity control agent selected from the group consisting of C_9–C_{24} fatty acids and mixtures thereof,

wherein the ratio of (a) to (b) is from 6:1 to 20:1.

4,426,300

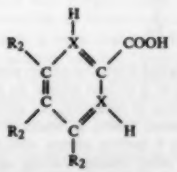
OXIDATION STABLE POLYOXYALKYLENES CONTAINING SALTS OF BENZOIC ACID DERIVATIVES

Edward M. Dexheimer, Grosse Ile; Michael J. Anchor, Canton Township, Plymouth County; Basil Thir, Grosse Ile, and Stephen E. Eisenstein, Oak Park, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 26, 1981, Ser. No. 315,245
Int. Cl.³ D06M *15/44, 13/18*
U.S. Cl. 252—8.9 12 Claims

1. A composition of matter comprising:

at least one aliphatic or aromatic-substituted polyoxyalkylene wherein said aliphatic polyoxyalkylene is derived from at least one alkylene oxide or glycidyl ether having 2 to 4 aliphatic carbon atoms and wherein said aromatic-substituted polyoxyalkylene is derived from at least one aromatic-substituted alkylene oxide or glycidyl ether having 2 to 4 aliphatic carbon atoms and an effective neutralizing amount of the alkali or alkaline earth metal salt of at least one acid having the formula:



(I)

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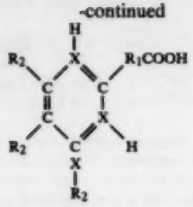


(II)

wherein R_1 is selected from the group consisting of alkyl and alkenyl groups having up to 6 carbon atoms; R_2 is individually selected from alkyl or alkenyl groups having up to 18 carbon atoms, nitro, halogen, carboxy, benzoyl groups or OR_3 groups wherein R_3 is hydroxyalkyl having up to 4 carbon atoms, an alkyl or alkenyl ester group having up to 18 carbon atoms; and X is selected from the group consisting of (1) carbon and (2) carbon together with nitrogen, with the proviso that when X is nitrogen, there is no hydrogen substituent.

4,426,301

POLYOXYALKYLENES CONTAINING ALKALINE CATALYST RESIDUES CHELATED WITH BENZOIC ACID DERIVATIVES

Edward M. Dexheimer, Grosse Ile; Michael J. Anchor, Canton Township, Plymouth County; Basil Thir, Grosse Ile, and Stephen E. Eisenstein, Oak Park, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

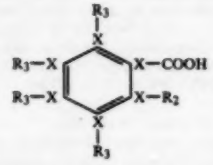
Filed Oct. 15, 1981, Ser. No. 311,668

Int. Cl.³ D06M *15/44, 13/18*

U.S. Cl. 252—8.9 **12 Claims**

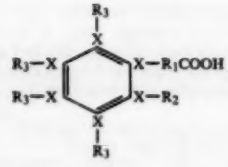
1. A composition of matter comprising:

at least one aliphatic or aromatic-substituted polyoxyalkylene wherein said aliphatic polyoxyalkylene is derived from at least one alkylene oxide or glycidyl ether having 2 to 4 aliphatic carbon atoms and wherein said aromatic-substituted polyoxyalkylene is derived from at least one aromatic substituted alkylene oxide or glycidyl ether having 2 to 4 aliphatic carbon atoms and an effective neutralizing amount of the alkali or alkaline earth metal salt of at least one acid having the formula:



(I)

or



(II)

wherein R_1 is selected from the group consisting of alkyl and alkenyl of up to 6 carbon atoms; R_2 is selected from the group consisting of hydroxyl, an alkyl ether residue having up to 4 carbon atoms, an hydroxyalkyl ether residue having up to 4 carbon atoms, and an alkenoxy or oxyalkanoic acid ester residue having up to 18 carbon atoms, and benzoyl; R_3 is individually selected from the group consisting of hydrogen, an alkyl ether residue having up to 4 carbon atoms, an hydroxyalkyl ether residue having up to 4 carbon atoms, an alkyl or alkenyl group having up to 6 carbon atoms, halogen, and carboxyl groups; and X is selected from the group consisting of (1) carbon and (2) carbon together with nitrogen.

4,426,302

OIL RECOVERY METHOD UTILIZING A DICYCLOPENTADIENE DERIVED ETHOXYSULFONATE

David R. McCoy; Robert M. Gipson, and Carter G. Naylor, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 24, 1982, Ser. No. 423,415

Int. Cl.³ C09K *3/00;* **E21B** *3/00;* **C07C** *149/44, 149/00*

U.S. Cl. 252—8.55 D **10 Claims**

1. A process for recovering petroleum from a subterranean petroleum-bearing formation penetrated by an injection well and a production well which comprises:

(A) injecting into the formation via the injection well a drive fluid comprising water having dissolved therein about 0.05 to about 5.0 percent by weight of a surface active agent having the general formula:

$$R—Y(CH_2CH_2O)_m(CH_2)_nSO_3X$$

wherein

R is a dicyclopentenyl moiety,

Y is a divalent moiety selected from the group consisting of oxygen and sulfur,

X is a cation selected from the group consisting of sodium, potassium and ammonium,

n is an integer of from 2 to 3,

m is an integer of from 1 to 10 with the proviso that when Y is sulfur, m is an integer of from 2 to 10;

(B) forcing the fluid through the formation and

(C) recovering petroleum through the production well.

5. An aqueous fluid comprising:

(A) about 0.1 wt. % to about 2 wt. % of a surface active agent of the formula:

$$R—Y(CH_2CH_2O)_m(CH_2)_nSO_3X$$

wherein

R is a dicyclopentenyl moiety,

Y is a divalent moiety selected from the group consisting of oxygen and sulfur,

X is a cation selected from the group consisting of a sodium, potassium and ammonium,

n is an integer of from 2 to 3,

m is an integer of from 1 to 10 with the proviso that when Y is sulfur, m is an integer of from 2 to 10; and

(B) about 0.5 wt. % to about 10 wt. % of a petroleum sulfonate.

4,426,303

SURFACTANT COMPOSITIONS USEFUL IN ENHANCED OIL RECOVERY PROCESSES

Nancy J. Nuckels, Carrollton, Tex., and James L. Thompson, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 99,264, Dec. 3, 1979, abandoned. This application May 26, 1981, Ser. No. 267,177

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D **12 Claims**

1. An aqueous surfactant composition comprising:

(1) at least one alkylated diaromatic sulfonate in an amount sufficient to impart good compatibility with subterranean reservoir brines,

(2) at least one petroleum sulfonate in an amount sufficient to provide an interfacial tension of no greater than 0.1 dyne

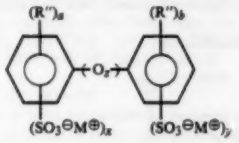
per centimeter between said aqueous composition and the oil of a subterranean reservoir,

(3) at least one condensation product of a C_8–C_{16} alkanol and a C_2–C_3 alkylene oxide as a solubilizing and wetting agent for said petroleum sulfonate, and

(4) at least one glycol ether of the formula:

$$R(OR')_n—OH \quad (I)$$

wherein R is a C_1–C_6 alkyl radical or a phenyl radical, R' is a C_2–C_4 alkylene radical, and n is 1–5 in an amount sufficient to reduce absorption of the other components of said composition on the surface of said reservoir, and wherein the alkylated diaromatic sulfonate is of the formula



(II)

each R'' is an alkyl radical of between about 10 and about 18 carbon atoms,

each $M^{\oplus}$ is a hydrogen, alkali metal ion, alkaline earth metal ion or ammonium ion,

a and b are individually 0 or 1 with the proviso that the Σ(a+b) is at least 1,

x and y are individually 0 or 1 with the proviso that the average value of Σ(x+y) for all (II) is at least about 1.7, and z is 0 or 1.

4,426,304

COMPOSITIONS FOR SOURING AND SOFTENING LAUNDERED TEXTILE MATERIALS, AND STOCK SOLUTIONS PREPARED THEREFROM

John D. Ciko, Allen Park; John J. Cramer, and Geoffrey A. Jamieson, both of Wyandotte, all of Mich., assignors to The Diversey Corporation, Wyandotte, Mich.

Division of Ser. No. 545,382, Jan. 30, 1975, Pat. No. 4,053,423. This application Nov. 22, 1976, Ser. No. 743,970

Int. Cl.³ C11D *7/32*; D06M *13/46*

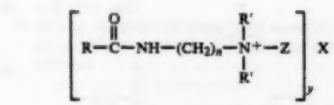
U.S. Cl. 252—8.75 **18 Claims**

1. A stable dry solid composition for souring laundered textile material and imparting softness thereto consisting essentially of

I. about 5–50% by weight of a softening agent for textile materials selected from the group consisting of

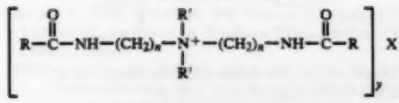
(A) quaternized fatty amides corresponding to the following structural formulae

1.



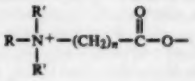
and

2.



wherein R is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 8–22 carbon atoms, R' is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 1–3 carbon atoms, Z is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing 1–22 carbon atoms, n contains about 1–6 carbon atoms, X is an anion selected from the group consisting of halide, sulfate, phosphate, alkyl sulfate having about 1–3 carbon atoms in the alkyl group and alkyl phosphate having about 1–3 carbon atoms in the alkyl group, and Y is an integer having a numerical value equivalent to the valency of X, and

(B) fatty amphoteric compounds corresponding to the structural formula



wherein R, R' and n are as defined in (A) above, the said amphoteric compounds having non-acidic isoelectric ranges; and

II. about 95–50% by weight of an acidic souring agent for freshly laundered textile materials selected from the group consisting of ammonium acid fluoride, sodium acid fluoride and potassium acid fluoride,

the said ingredients I and II being present in amounts whereby a stable solid composition is produced for souring laundered textile materials and imparting softness thereto.

4,426,305

LUBRICATING COMPOSITIONS CONTAINING BORONATED NITROGEN-CONTAINING DISPERSANTS

Robert E. Malec, Ladue, Mo., assignor to Edwin Cooper, Inc., St. Louis, Mo.

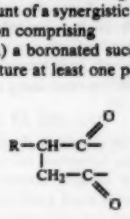
Continuation-in-part of Ser. No. 246,280, Mar. 23, 1981, abandoned. This application Jun. 1, 1983, Ser. No. 499,917

Int. Cl.³ C10M *1/54*

U.S. Cl. 252—49.6 **7 Claims**

1. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity containing a minor dispersant amount of a synergistic combination of dispersants, said combination comprising

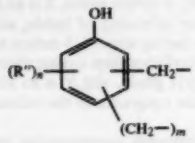
(A) a boronated succinimide dispersant having in its structure at least one polybutene-substituted succinoyl group



wherein R is a polybutene group having a molecular weight of about 700–2000, said succinoyl group being bonded to a nitrogen atom of an oxyethylated polyethyleneamine containing 2 to about 6 ethylene amine units to form an amide or imide or to an oxygen atom of said oxyethylated polyethyleneamine to form an ester or to both nitrogen and oxygen atoms of said oxyethylated polyethyleneamine to form a mixture containing amide, imide and ester groups, said oxyethylated polyethyleneamine being made by reacting 1 mole of polyethyleneamine with about 0.5–5 moles of ethylene oxide, said succinimide dispersant being further characterized by containing about 0.001–2.5 weight percent boron

and

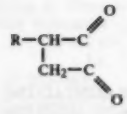
(B) a Mannich dispersant having in its structure a polybutene-substituted phenolic group



wherein R'' is a polybutene group and n is 1 or 2 m is 0 or 1, n+m is 1 or 2, said R'' groups containing about 50–500 carbon atoms, said phenolic group being bonded through a methylene group to a nitrogen atom of a polyethylene amine containing 2 to about 6 ethyleneamine units, at least part of said Mannich dispersant having been reacted with a fatty acid and at least part of said Mannich having been reacted with a boronating agent.

7. An additive package formulated for addition to lubricating oil to obtain a formulated motor oil suitable for use in an internal combustion engine, said package containing a synergistic combination of dispersants comprising

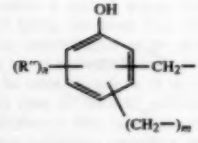
(a) a boronated succinimide dispersant having in its structure at least one polybutene-substituted succinoyl group



wherein R is a polybutene group having a molecular weight of about 700–2000, said succinoyl group being bonded to a nitrogen atom of an oxyethylated polyethyleneamine containing 2 to about 6 ethylenamine units to form an amide or imide or to an oxygen atom of said oxyethylated polyethyleneamine to form an ester or to both nitrogen and oxygen atoms of said oxyethylated polyethyleneamine to form a mixture containing amide, imide and ester groups, said oxyethylated polyethyleneamine being made by reacting 1 mole of polyethyleneamine with about 0.5–4 moles of ethylene oxide, said succinimide dispersant being further characterized by containing about 0.001–2.5 weight percent boron

and

(b) a Mannich dispersant having in its structure a polybutene-substituted phenolic group



wherein R'' is a polybutene group and n is 1 or 2, m is 0 or 1, n+m is 1 or 2, said R'' groups containing about 50–500 carbon atoms, said phenolic group being bonded through a methylene group to a nitrogen atom of a polyethyleneamine containing 2 to about 6 ethyleneamine units, at least part of said Mannich dispersant having been reacted with oleic acid and at least part of said Mannich having been reacted with a boronating agent.

4,426,306

ANTIOXIDANTS AND LUBRICATING OIL CONTAINING SAME

Richard J. Lee, Downers Grove, Ill., and Lynn M. R. Murphy, Lafayette, La., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 59,246, Jul. 20, 1979, Pat. No. 4,390,437. This application Sep. 20, 1982, Ser. No. 420,304

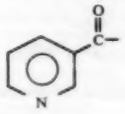
Int. Cl.³ C10M *1/20, 1/32*

U.S. Cl. 252—51.5 A **6 Claims**

1. An antioxidant catalyst which functions as a chain terminating species in the chain oxidation reaction that occurs in lubricant compositions under conditions of use comprising an antioxidant additive having the structure $A[(X)_{m-1}Y]_n$ wherein:

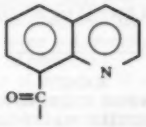
(a) A is an antioxidant functional moiety selected from the group consisting of:

(1) nicotinyl having the structure:



and

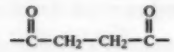
(2) 8-carbonyl quinoline having the structure:



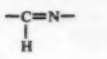
and

(b) $[(X)_{m-1}Y]_n$ is an oil soluble moiety wherein:

(1) X is a divalent member connected directly to A and Y, respectively, and is selected from the group consisting of succinyl, imine, amino, and dialkyl piperazine succinimide having the structures:

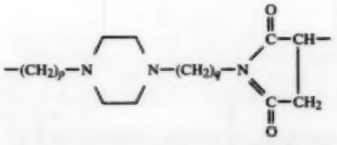


(i)



(ii)

(iii)



(iv)

wherein p and q are whole numbers from 1 to 6,

(2) m is a whole number from 1 to 2,

(3) Y is a monovalent aliphatic chain of from 12 to 50 carbon atoms whose valence is connected directly to X when m is 2 and directly to A when m is 1,

(4) n is a whole number from 1 to 2 and corresponds to the number of free valences in A; and

(c) when X is amino and m is 2; and when X is dialkyl pipera-

zine succinimide and m is 2, A is any of the structures previously designated in (a) and n is from 1 to 2;

(d) when m is 1, A is any of the structures previously designated in (a) and n is from 1 to 2; whose calculating energy of the nearest unoccupied molecular orbital is greater than or equal to 0.7 and whose corresponding lubricant viscosity requires greater than or equal to 60 hours of use to increase to four times its initial value.

4,426,307

HEAT ACCUMULATIVE MATERIAL

Takahiro Wada, Katano, and Ryoichi Yamamoto, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 6, 1982, Ser. No. 395,707

Claims priority, application Japan, Jul. 17, 1981, 56-112494; Aug. 13, 1981, 56-127631; Aug. 13, 1981, 56-127632; Dec. 7, 1981, 56-197503; Jan. 19, 1982, 57-7051; Feb. 17, 1982, 57-24720; Feb. 19, 1982, 57-26225

Int. Cl.³ C09K *5/06*

U.S. Cl. 252—70 **10 Claims**

1. A heat accumulative material comprising a system containing three or more components, consisting of sodium acetate (CH_3COONa) and water (H_2O), mixed with at least one component selected from the group consisting of urea ($CO(NH_2)_2$), acetamide (CH_3CONH_2), formamide ($HCONH_2$), glycine (NH_2CH_2COOH) and alanine ($CH_3(NH_2)CHCOOH$), wherein CH_3COONa is contained in an amount within the range of 10 to 70% by weight, and H_2O is contained in an amount within the range of 10 to 55% by weight, $CO(NH_2)_2$ is contained, if present, in an amount of 65% by weight or less (exclusive of 0%), CH_3CONH_2, if present, is contained in an amount of 80% by weight or less (exclusive of 0%), $HCONH_2$, if present, is contained in an amount of 50% by weight or less (exclusive of 0%), NH_2CH_2COOH, if present, is contained in an amount of 40% by weight or less (exclusive of 0%), $CH_3(NH_2)CHCOOH$, if present, is contained in an amount of 35% by weight or less (exclusive of 0%).

4,426,308

PROCESS OF MAKING CALCIUM ACETATE DEICING AGENTS

Alan B. Gancy, 265 Robineau Rd., Syracuse, N.Y. 13207

Division of Ser. No. 333,037, Dec. 21, 1981, Pat. No. 4,377,488. This application Mar. 18, 1983, Ser. No. 476,702

Int. Cl.³ C09K *3/18;* **C07C** *51/41;* **C01F** *11/00*

U.S. Cl. 252—70 **1 Claim**

1. In a process of making a calcium acetate-containing solution having a pH value at room temperature in the range from about 7 to about 8, the steps comprising:

a. completely reacting a carbonate with acetic acid, wherein the amount of said carbonate comprises from about 50% to about 70% of the total stoichiometric complement of said acid; and

b. adding calcined limestone in an amount comprising from about 25% to about 50% of said total stoichiometric complement.

4,426,309

ANTIFREEZE CORROSION INHIBITOR COMPOSITION FOR ALUMINUM ENGINES

Michael L. Abel, Plainfield, and Thomas P. Yates, Frankford, both of Ill., assignors to Northern Petrochemical Company, Omaha, Nebr.

Division of Ser. No. 280,877, Jul. 6, 1981, Pat. No. 4,382,870. This application Mar. 10, 1983, Ser. No. 473,944

Int. Cl.³ C09K *5/00;* **F28F** *23/00*

U.S. Cl. 252—75 **1 Claim**

1. A method for providing corrosion inhibition in aluminum-containing internal combustion engines which utilize a polyhydroxyalcohol-based coolant, comprising adding to said coolant:

(a) from about 0.07% to about 0.35% nitrate,

(b) from about 0.04% to about 0.08% silicate,

(c) from about 0.05% to about 0.25% of a compound selected from a group consisting of tolyltriazole, benzotriazole, and mixtures thereof,

(d) from about 0.2% to about 1.5% borate, and

(e) from about 0.2% to about 0.75% phosphate,

wherein the cations are selected from the group consisting of sodium, potassium, and mixtures thereof and wherein the pH of the composition is from about 9 to about 11.5.

4,426,310

LOW-IRRITATION SHAMPOO

Pierre M. Verunica, Lane Cove, Australia, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 19, 1982, Ser. No. 359,737

Int. Cl.³ C11D *1/29, 1/62, 1/94;* **A61K** *7/08*

U.S. Cl. 252—106 **7 Claims**

5. A mild, clear, liquid shampoo, the pH of which is in the range of 1 to 3, and aqueous solutions of which do not cause a burning sensation when brought into contact with children's eyes, which consists essentially of, by weight, (A) 5% to 8% of an alkali metal C_{10}–C_{14} alkyl polyethenoxy ether sulfate containing from 1 to 4 moles of ethylene oxide, (B) 4% to 6% of a polyethoxylated glyceryl C_8–C_{16} fatty acid monoester containing from 60 to 100 moles of ethylene oxide per mole; (C) 3% to 5% of a polyoxyethylene sorbitan monooleate of 10 to 30 moles of ethylene oxide per mole; (D) 2.5% to 4% of a zwitterionic detergent selected from the group consisting of N—C_8–C_{16} alkyl dimethyl betaine, N—C_8–C_{18} alkylamidopropyl dimethyl betaine and mixtures thereof; (E) 1% to 2.5% of an alkali metal C_{10}–C_{14} alkyl polyethenoxy sulfosuccinate containing from 1 to 4 moles of ethylene oxide and (F) 70% to 84.5% of an aqueous medium, said shampoo having a viscosity at 25° C. in the range of 300 to 600 centipoises and a cloud point below 8° C.

4,426,311

METHYLENE CHLORIDE-METHANE SULFONIC ACID STRIPPING COMPOSITIONS AND METHODS FOR USING SAME

John E. Vander Mey, Stirling, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 166,502, Jul. 7, 1980, abandoned. This application Dec. 23, 1981, Ser. No. 333,946

The portion of the term of this patent subsequent to Aug. 21, 1996, has been disclaimed.

Int. Cl.³ C11D *7/08, 7/52*

U.S. Cl. 252—143 **21 Claims**

21. A method for removing polymeric organic substances from an inorganic substrate which comprises contacting the polymeric organic substances with a stripping composition comprising from about 99 to about 60 weight percent methylene chloride and from about 1 to about 40 weight percent methane sulfonic acid at a temperature of from about 15° C. to about 40° C. for a period of time sufficient to remove said polymeric organic substances.

4,426,312

LIQUID CRYSTAL MATERIAL CONTAINING DISAZO DYESTUFFS

Uwe Claussen, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

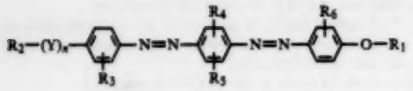
Filed Dec. 14, 1981, Ser. No. 330,631

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049454

Int. Cl.³ C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299.1 **10 Claims**

1. Liquid crystal composition comprising a host liquid crystal having dissolved therein a disazo dyestuff of the formula



(I)

in which

R_1 designates alkyl, aralkyl, cycloalkyl, aryl, or a R—N-H—CO—,

in which

R represents alkyl, aralkyl, cycloalkyl or aryl, it being possible for the radicals mentioned for R_1 to be substituted by fluorine, chlorine, bromine, C_1–C_8-alkyl, trifluoromethyl, C_1–C_8-alkoxy, nitro, cyano, amino, amino which is optionally mono or disubstituted by C_1–C_8-alkyl or phenyl, and

n is 0 or 1,

Y designates —O—,

R_2 has one of the meanings given above for R_1, if n=1, or is hydrogen, if n=0, and

R_3, R_4, R_5 and R_6 designate hydrogen, alkyl, alkoxy, halogen or cyano.

4,426,313

PREPARATION OF SURFACTANTS BY SULFONATING DERIVATIVES OF DEPOLYMERIZED COAL

Raymond J. Swedo, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 18, 1982, Ser. No. 435,135

Int. Cl.³ B01F *17/12*

U.S. Cl. 252—353 **7 Claims**

1. A process for the preparation of neutralized sulfonated derivatives of depolymerized coal as a surfactant which comprises treating the product obtained from the depolymerization of coal in the presence of a catalyst consisting essentially of a boron trifluoride etherate in a solvent comprising a mono- or polyhydroxy aromatic hydrocarbon with a sulfonating agent at sulfonation conditions, neutralizing the sulfonated product and recovering said neutralized sulfonated derivative of depolymerized coal surfactant.

4,426,314

MAGNESIUM-CONTAINING SOLID

Makoto Miyazaki; Takeshi Nomura, both of Ooi; Chihiro Imai, Yokohama, and Makoto Yoda, Kawagoe, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 320,164

Claims priority, application Japan, Nov. 28, 1980, 55/166735

Int. Cl.³ C08F *4/64, 4/02*

U.S. Cl. 502—169 **18 Claims**

1. A magnesium-containing solid obtained by contacting the reaction product of (1):

(a) metallic magnesium;

(b) a halogenated hydrocarbon of the general formula RX in which R stands for an alkyl, aryl or cycloalkyl group having 1 to 20 carbon atoms, and X stands for a halogen atom; and

(c) an alkoxy compound of the general formula $X'_mC(OR')_{4-m}$ in which X' stands for a hydrogen or halogen atom, or an alkyl, aryl or cycloalkyl group having 1 to 10 carbon atoms, R' stands for an alkyl, or cycloalkyl group having 1 to 20 carbon atoms, and m is 0, 1 or 2, with

(2) an electron donative compound and hydrogen halide.

5. A catalyst component for polymerization of olefins comprising a titanium compound supported on the magnesium-containing solid of claim 1.

4,426,315

PROCESS FOR THE PREPARATION OF SUPPORTED CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Müfit Bahadir, Zolling; Wolfgang Payer, Wesel; Ingrid Förster, Mülheim, and Hans-Albert Lümmen, Essen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,812

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1981, 3100736

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—113 **24 Claims**

1. In a process for the preparation of a supported catalyst for the polymerization of olefins having a component A and a component B, wherein said component A consists essentially of a reaction product of

at least one first compound of one or more first metals of subgroups IV to VI of the Periodic Table of the Elements with

at least one organic compound of one or more second metals of main groups I to III of the Periodic Table of the Elements, said reaction being carried out at a temperature of from −60° C. to 40° C., and

an inorganic carrier,

said component B being an organometallic compound,

the improvement which comprises suspending said carrier in a suspension agent, said agent being substantially oxygen, sulfur and moisture free, simultaneously and separately adding to said carrier and said agent said first compound and said organic compound in liquid and/or dissolved form, excluding oxygen and moisture, the molar ratio of said first compound to said organic compound being 1:3 to 3:1.

4,426,316

CATALYST PREPARED FROM ORGANOMAGNESIUM COMPOUND, ORGANIC HYDROXYL-CONTAINING COMPOUND, REDUCING HALIDE SOURCE AND TRANSITION METAL COMPOUND

Donald E. Gessell, Ponca City, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 10, 1982, Ser. No. 416,447

Int. Cl.³ C08F *4/64, 4/68, 4/62*

U.S. Cl. 502—169 **4 Claims**

1. A catalytic product resulting from

(I) admixing in an inert hydrocarbon diluent and in an atmosphere which excludes moisture and oxygen

(A) at least one hydrocarbon soluble organomagnesium material;

(B) at least one organic alcoholic hydroxyl-containing material;

(C) at least one reducing halide source; and

(D) at least one transition metal (Tm) compound; and

(II) heating the resultant mixture at a temperature of from about 35° C. up to the boiling point of the inert hydrocarbon diluent, for a time to permit substantial reaction of the resultant mixture as indicated by a change in color of the mixture; and wherein

(1) the components are added in the order (A), (B), (C) and (D) or (A), (B), (D) and (C); and

(2) the components are employed in quantities so as to provide the following atomic ratios

Mg:Tm of from about 0.1:1 to about 50:1;

Cl:Mg of from about 2:1 to about 5:1; and

the OH:total number of hydrocarbyl groups attached to a metal atom in component (A) is from about 0.5:1 to about 1.2:1.

4,426,317
PROCESS FOR MAKING OLEFIN POLYMERIZATION CATALYST

Thomas K. Rogers, Greenville, S.C., assignor to Cities Service Company, Tulsa, Okla.

Filed Nov. 24, 1982, Ser. No. 444,295
Int. Cl.³ C08F 4/02, 4/68
U.S. Cl. 502—120 27 Claims

1. In a process for preparing an olefin polymerization catalyst composition by:

(1) drying an inorganic oxide having surface hydroxyl groups to form a support that is substantially free of adsorbed water,

(2) slurry and dried inorganic oxide in an inert liquid hydrocarbon,

(3) reacting the surface hydroxyl groups of the dried inorganic oxide with at least about 0.5 mol, per mol of surface hydroxyl groups, of at least one organometallic compound corresponding to the formula $R_xMR'_yR''_z$, wherein M is a metal of Group III of the periodic table, R is an alkyl group containing 1 to 12 carbon atoms, R' and R'' are independently selected from the group consisting of H, Cl, and alkyl and alkoxy groups containing 1 to 12 carbon atoms, x has a value of 1 to 3, and y and z both represent values of 0 to 2, the sum of which is not greater than 3-x, and

(4) reacting the thus-treated support with at least about 0.001 mol, per mol of organometallic compound, of at least one vanadium compound wherein the vanadium has a valence of at least +3,

the improvement which comprises:

(A) conducting the reactions with agitation in an amount of inert liquid hydrocarbon such as to provide a weight/unit volume solids content of about 10 to 50% and

(B) adding the vanadium compound to the agitated slurry of treated inorganic oxide particles at a rate such as to ensure substantially uniform distribution of the vanadium compound on the particles as it reacts therewith.

4,426,318
SUPPORTED POLYETHYLENE POLYMERIZATION CATALYSTS UTILIZING SUBSTITUTED POLYSTYRENE RESINS

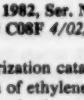
Richard W. Fries, Joliet, and Charles K. Buehler, Naperville, both of Ill., assignors to Northern Petrochemical Company, Omaha, Nebr.

Filed Dec. 1, 1982, Ser. No. 446,057
Int. Cl.³ C08F 4/02, 4/64
U.S. Cl. 502—154 3 Claims

1. A supported polymerization catalyst for the polymerization and copolymerization of ethylene which comprises:

(1) a reduced tetravalent titanium compound,

(2) an aluminum alkyl of the formula



where X and Y are each alkyl of not more than 8 carbon atoms, and Z is chlorine or alkyl of not more than 8 carbon atoms, and

(3) a polystyrene resin which is substituted on the phenyl rings thereof wherein the substituent groups are selected from the group consisting of hydroxymethyl, chloromethyl, and sulphonate, and wherein the resin is modified by treatment with magnesium salts prior to treatment with the titanium compound.

4,426,319
CATALYST FOR TREATMENT OF EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

Gilbert Blanchard, Le Plessis-Belleville; Jean-Pierre Brunelle, Saint-Brice sous Foret, and Michel Prigent, Rueil Malmaison, all of France, assignors to Procatalyse, Rueil Malmaison, France

Filed Mar. 5, 1982, Ser. No. 355,184
Claims priority, application France, Mar. 9, 1981, 81 04596
Int. Cl.³ B01J 23/10, 23/62, 23/89
U.S. Cl. 502—241 18 Claims

1. A stable, long-lived catalyst which comprises (1) a support substrate and (2) an active phase deposited thereon, said active phase (2) comprising (i) cerium, (ii) iron, (iii) at least one of the metals of gallium and/or yttrium, (iv) at least one of the metals platinum and/or palladium, and (v) at least one of the metals iridium and/or rhodium.

4,426,320
CATALYST COMPOSITION FOR EXHAUST GAS TREATMENT

Michael V. Ernest, Baltimore, and James M. Maselli, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 228,832, Jan. 27, 1981. This application Jun. 17, 1982, Ser. No. 394,220
Int. Cl.³ B01J 21/04, 23/64, 23/72, 35/04
U.S. Cl. 502—313 14 Claims

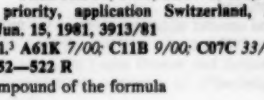
1. A composition for converting one or more pollutants in an exhaust gas to innocuous entities and removing suspended particles from the gas which comprises a catalyst material effective for the conversion deposited on a coarse ceramic foam filter having a pore size of from about 2 to about 20 pores per 25 millimeters in length and on a fine ceramic foam filter having a pore size of from about 15 to about 50 pores per 25 millimeters in length, said filters positioned so that the gas flows in succession through the coarse filter and the fine filter.

4,426,321
ODORANT ALKADIENYL KETONES, ALCOHOLS AND OXIMES

Paul A. Ochsner, Geneva, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Jul. 24, 1981, Ser. No. 286,313
Claims priority, application Switzerland, Aug. 8, 1980, 6019/80; Jun. 15, 1981, 3913/81
Int. Cl.³ A61K 7/00; C11B 9/00; C07C 33/02, 49/203
U.S. Cl. 252—522 R 35 Claims

1. A compound of the formula



I

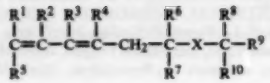
wherein:

(i) X stands for

(ii) R^1 through R^{10} are alike or different and are selected from the group consisting of hydrogen, methyl, ethyl, n-propyl and isopropyl except that when both R^6 and R^7 are hydrogen, none of the groups R^8, R^9, or R^{10} is hydrogen, and

(iii) the total number of carbon atoms in the molecule does not exceed fifteen.

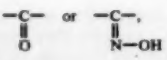
19. An odorant composition comprising an olfactorily effective amount of a compound of the formula



I

wherein:

(i) X stands for

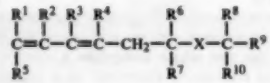


(ii) R^1 through R^{10} are alike or different and are selected from the group consisting of hydrogen, methyl, ethyl, n-propyl and isopropyl except that when both R^6 and R^7 are hydrogen, none of the groups R^8, R^9 or R^{10} is hydrogen, and

(iii) the total number of carbon atoms in the molecule does not exceed fifteen.

and at least one other olfactory ingredient.

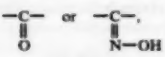
35. A method for improving the odor of fragrance compositions which comprises adding thereto an olfactorily effective amount of a compound of the formula



I

wherein:

(i) stands for



(ii) R^1 through R^{10} are alike or different and are selected from the group consisting of hydrogen, methyl, ethyl, n-propyl and isopropyl except that when both R^6 and R^7 are hydrogen, none of the groups R^8, R^9 or R^{10} is hydrogen, and

(iii) the total number of carbon atoms in the molecule does not exceed fifteen.

4,426,322

METHOD AND APPARATUS FOR THE DESALINATION OF CRUDE TALL OIL

Hermann Stage, Ludgeristrasse 9, 4400 Muenster, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 447,215

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225337

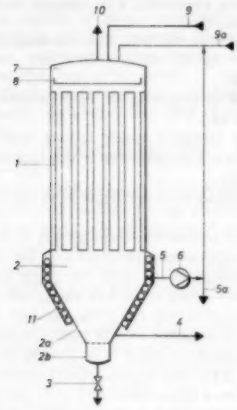
Int. Cl.³ C09F *1/00*; B01D *1/22, 3/08*

U.S. Cl. 260—97.7 **21 Claims**

1. A method for removing salts from crude tall oil having said salts dissolved or emulsified therein, wherein said method comprises:

providing and contacting water with said oil at a temperature above 100° C.;

maintaining said oil and said water under a predetermined pressure; and



effecting a mass transfer between said water and said oil such that said water remains in a liquid aggregate state.

4,426,323

SELECTED RECOVERY OF PROTEINS FROM FERMENTATION BROTHS

Surendar Jain, Watertown, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Continuation-in-part of Ser. No. 256,264, Apr. 21, 1981, which is a continuation-in-part of Ser. No. 111,144, Jan. 10, 1980, Pat. No. 4,276,140. This application Jun. 8, 1981, Ser. No. 271,069

The portion of the term of this patent subsequent to Mar. 30, 1999, has been disclaimed.

Int. Cl.³ A23J *1/06*; A23K *37/04*; C07G *7/00*; G12P *21/00*

U.S. Cl. 260—112 R **13 Claims**

1. A process for separating and recovering a selected protein or selected group of proteins from a fermentation broth containing a mixture of selected and non-selected proteins comprising the steps of:

(a) removing when present substantially all initial turbidity from said broth;

(b) subsequently passing said broth into and out of a membrane desalting apparatus in contact with one surface of one or more semi-permeable membranes, said membrane separating said broth stream from an adjacent salt receiving stream thereby causing a decrease in the salt concentration of said broth;

(c) said broth being adjusted in pH to within substantially the collective isoelectric point range of the non-selected protein sufficient to cause the formation of a first turbid phase containing essentially the said non-selected proteins and a first liquid phase enriched in the said selected protein;

(d) subsequently removing substantially all of said first formed turbid phase;

(e) passing the remaining first liquid phase into and out of said desalting apparatus to further decrease the salt concentration;

(f) adjusting the pH to within the isoelectric point of the selected protein of interest thereby forming a second turbid phase enriched in the said selected protein of interest;

(g) and separating the said second turbid phase for subsequent resuspension or purification.

4,426,324

IMMUNOPOTENTIATING PEPTIDES

Johannes A. Meienhofer, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 79,630, Sep. 28, 1979, abandoned. This application Apr. 28, 1980, Ser. No. 144,516

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R 6 Claims

1. A compound of the formula

X—Glu—Asn—OH

where

X is H, H—Ala—, H—Glu—Glu—Ala—, H—Val—Glu—Glu—Ala— and H—Val—Val—Glu—Glu—Ala—

and the pharamaceutically acceptable salts thereof.

4,426,325

PROCESS FOR THE PREPARATION OF COMPOUNDS CONTAINING CARBOXYLIC ACID AMIDE GROUPS, IN PARTICULAR OR PEPTIDES

Hans Wissmann, Bad Soden am Taunus, and Hans-Jerg Kleiner, Kronberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 15, 1982, Ser. No. 339,788

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101427

Int. Cl.³ C07C *103/52;* C07F *9/02;* C09F *5/00*

U.S. Cl. 260—112.5 R 4 Claims

1. A process for the preparation of compounds containing carboxylic acid amide groups, which comprises reacting compounds containing a carboxy group, in the presence of dialkylphosphinic acid anhydrides, with compounds containing a free amino group and splitting off radicals that may have been introduced to protect other functional groups.

4,426,326

NONDIFFUSIBLE METAL-COMPLEXED AZO DYE-RELEASING COMPOUNDS

Joseph Bailey, Bushey Heath; David Clarke, Watford, and Linda G. Johnston, Wealdstone, all of England, assignors to Eastman Kodak Company, Rochester, N.Y.

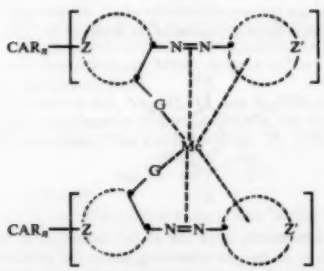
Division of Ser. No. 324,214, Nov. 23, 1981, Pat. No. 4,358,527. This application Jun. 28, 1982, Ser. No. 392,482

Claims priority, application United Kingdom, Nov. 24, 1980, 8037643

Int. Cl.³ C09B *45/02, 45/12, 45/22, 45/32*

U.S. Cl. 260—146 R 19 Claims

1. A nondiffusible compound having a releasable azo dye moiety, said compound having the following formula:



wherein:

(a) each Z independently represents the atoms necessary to complete an aromatic carbocyclic or heterocyclic nucleus having at least one ring of 5 to 7 atoms;

(b) each Z′ independently represents an aromatic carbocyclic or heterocyclic nucleus having at least one ring of 5 to 7 atoms, said Z′ having, in a position adjacent to the point of attachment to the azo linkage, either (i) a nitrogen atom in said ring of said nucleus which acts as a chelating site, or (ii) a carbon atom in said ring of said nucleus having directly attached thereto a nitrogen atom which acts as a chelating site;

(c) G is a metal chelating group;

(d) each CAR independently represents a ballasted carrier moiety which will release said diffusible azo dye under alkaline conditions;

(e) Me is a polyvalent, hexacoordinate metal ion; and

(f) each n is 0 or 1, with the proviso that at least one n is 1.

4,426,327

3,6-DISAZO-9-ETHYL CARBAZOLE COMPOUNDS

Mitsuru Hashimoto, Hino; Masafumi Ohta; Akio Kozima, both of Yokohama; Kiyoshi Sakai, Tokyo, and Masaomi Sasaki, Kawasaki, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

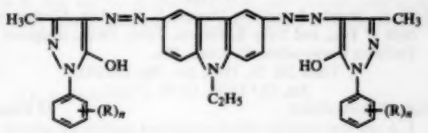
Division of Ser. No. 872,679, Jan. 26, 1978, Pat. No. 4,293,628. This application Nov. 5, 1980, Ser. No. 204,150

Claims priority, application Japan, Jan. 31, 1977, 52-8740; Jan. 31, 1977, 52-8741

Int. Cl.³ C09B *35/24, 35/34;* C07D *209/88;* G03G *5/06*

U.S. Cl. 260—160 3 Claims

1. A compound having the formula



wherein R is alkyl, alkoxy, nitro, dialkylamino or halogen, n is zero or an integer of from 1 to 3, and R can be the same or different when n is 2 or 3.

4,426,328

REACTIVE DYES, THEIR PREPARATION AND USE

Jean-Marie Adam, St. Louis, France, and Arthur Bühler, Rheinfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

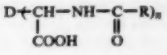
Filed Sep. 29, 1980, Ser. No. 191,551

Claims priority, application Switzerland, Oct. 5, 1979, 9017/79

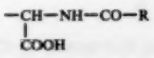
Int. Cl.³ C09B *1/40, 47/04, 29/06*

U.S. Cl. 260—162 13 Claims

1. A dye of the formula

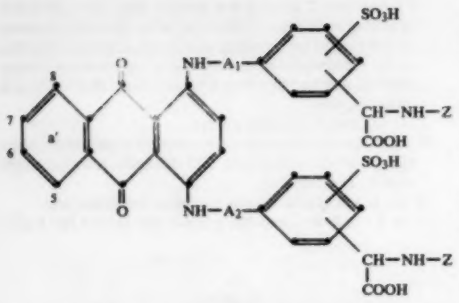


in which D is an organic dye radical which contains at least one group conferring solubility in water, R is a halogenoalkyl radical having 1 to 2 C atoms or a halogenoacryl radical and n is an integer from 1 to 4 and each group of the formula



is bonded to D via an aromatic carbon atom.

6. A dye according to claim 1, of the formula



in which A_1 and A_2 are each an unbranched or branched alkylene group having not more than 5 carbon atoms and Z is an α,β-dichloro-propionyl group, an α,β-dibromo-propionyl group, an α-chloro-acryloyl group, an α-bromo-acryloyl group or a chloroacetyl group, and in which the ring a' is unsubstituted or substituted by hydroxyl or halogen.

4,426,329

ONE STEP MODIFICATION AND OXIDATION OF WAXES

John H. Woods, Longview; Charles E. Laughlin, Gladewater, both of Tex., and Toby R. Graves, Tulsa, Okla., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Jul. 31, 1981, Ser. No. 288,852

Int. Cl.³ C07C *53/00, 27/10*

U.S. Cl. 260—398.6 **12 Claims**

1. A one step process which comprises oxidizing a natural or synthetic non-benzenoid hydrocarbon wax having, prior to oxidation, a molecular weight of about 300 to 5000 and a melting point of about 110° F. to 300° F., said process consisting essentially of (1) adding about 12 to 50 acid number equivalents of a Group IA metal oxide or hydroxide to said wax; and (2) oxidizing the wax at about 200° F. to 450° F. for at least five hours and terminating the oxidation when the product has an alkalinity of greater than about 1.

4,426,330

SYNTHETIC PHOSPHOLIPID COMPOUNDS

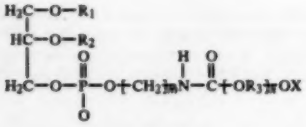
Barry D. Sears, Marblehead, Mass., assignor to Lipid Specialties, Inc., Cambridge, Mass.

Filed Jul. 20, 1981, Ser. No. 284,675

Int. Cl.³ C07F *9/02*

U.S. Cl. 260—403 **9 Claims**

1. A phosphatidyl alkylene oxide compound having the structural formula:



where R_1 and R_2 are hydrogen or C_2–C_{24} organic acyl radicals; R_3 is a C_2–C_3 alkylene radical, X is hydrogen or an alkyl radical, n is a number of from 0 to about 200, and m is a number of from 2 to 10.

4,426,331

PREPARATION OF CARBONATE ESTERS IN THE PRESENCE OF SULFONES

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 19, 1982, Ser. No. 399,167

Claims priority, application United Kingdom, Jul. 30, 1981, 8123325

Int. Cl.³ C07C *68/00*

U.S. Cl. 260—463 **10 Claims**

1. In a process for the preparation of carbonate esters which comprises reacting an alcohol with carbon monoxide and oxygen in the presence of a copper (II) compound as catalyst, the improvement which comprises carrying out the reaction in the further presence of a sulfone, with the provision that the molar ratio of said sulfone to said alcohol is in the range of from 0.25:1 to 10:1.

4,426,332

PREPARATION OF RESORCINOL DERIVATIVES

Frank Thoemel, Weinheim, and Werner Hoffmann, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

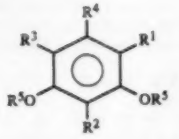
Filed Apr. 21, 1982, Ser. No. 370,404

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 3116913

Int. Cl.³ C07C *121/75, 37/00, 41/00, 69/84*

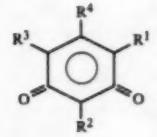
U.S. Cl. 260—465 F **8 Claims**

1. A process for the preparation of a resorcinol derivative of the formula I



(I)

where R^1 is lower carbalkoxy, nitrile, lower alkyl or hydrogen and R^2 to R^5 are hydrogen or lower alkyl, wherein the corresponding cyclohexane-1,3-dione of the formula II



(II)

where the substituents have the above meanings, is reacted with oxygen or an oxygen-containing gas in the presence of a catalytic amount of a copper compound and in the presence of from 1 to 10 moles of a hydrogen halide, or of from 0.5 to 5 moles of thionyl chloride, per mole of II, in a substantially anhydrous alkanol of from 1 to 6 carbon atoms, substantially anhydrous tetrahydrofuran or substantially anhydrous methyl tert.-butyl ether as the solvent, at from 0° to 150° C.

4,426,333

PROCESS FOR THE PREPARATION OF 1-BENZOYLAMINO-8-HYDROXYNAPHTHALENE-4,6-DISULPHONIC ACID (BENZOYL-K ACID)

Erich Hammerschmidt, Bergisch Gladbach; Horst Behre, Odenthal; Bruno Krüger, Cologne, and Adolf Winkler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,386

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118903

Int. Cl.³ C07C *143/42*

U.S. Cl. 260—507 R 10 Claims

1. In the process for the preparation of 1-benzoylamino-8-hydroxynaphthalene-4,6-disulphonic acid (benzoyl-K acid) by reacting 1-amino-8-hydroxynaphthalene-4,6-disulphonic acid (K acid) with benzoylating agents and isolating the benzoyl-K acid in the form of its alkali metal salt, the improvement which comprises using instead of pure K acid a mixture of aminonaphtholdisulphonic acid isomers which contains over 40% to 90% by weight of K acid, relative to the total amount of diazotisable compounds in the mixture of isomers, on the basis of a molecular weight of 319, and in which mixture no other single isomer has a proportion which exceeds 10% by weight of the total amount of diazotisable compounds in this mixture.

4,426,334

PROCESS FOR ISOLATING H ACID AND K ACID

Horst Behre; Heinz U. Blank, both of Odenthal; Otto Lindner, Bergisch Gladbach, and Willi Schüssler, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,194

Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3118147

Int. Cl.³ C07C *143/48*

U.S. Cl. 260—509 6 Claims

1. In the process for isolating H acid and K acid in the form of their monoalkali metal salts from acid aqueous solutions which contain these two acids and alkali metal ions and which may contain other aminonaphtholdisulphonic acids, by precipitating H acid monoalkali metal salts at elevated temperatures and precipitating K acid monoalkali metal salts by cooling down the filtrate obtained on separating off the H acid, the improvement comprising precipitating the H acid from a solution which contains not only sodium ions but also potassium ions the ratio of sodium ions to potassium ions being 5–1:1.

4,426,335

PROCESS FOR MAKING PHOSPHORUS DERIVATIVES OF AMINOTHIOMETHYLCARBAMATES

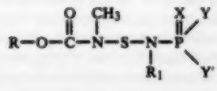
Clifford E. Sacks, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 181,611, Sep. 5, 1980, abandoned, which is a continuation-in-part of Ser. No. 151,557, May 20, 1980, abandoned. This application May 14, 1982, Ser. No. 378,156

Int. Cl.³ C07F *9/24*

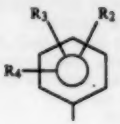
U.S. Cl. 260—968 22 Claims

1. A process for preparing a compound having the formula:



I

wherein R is selected from the group consisting of

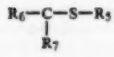


a.

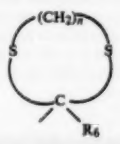
wherein R_2, R_3, and R_4 are the same or different and are selected from the group consisting of hydrogen, lower alkyl of one to five carbon atoms, inclusive, halogen, lower alkoxy of one to five carbon atoms, inclusive, lower alkylthio of one to five carbon atoms, inclusive, dialkylamino with each alkyl the same or different and having one to three carbon atoms, inclusive, and $N{=}CHN(CH_3)_2$;

B.

wherein A and B are the same or different and are selected from the group consisting of lower alkyl of one to five carbon atoms, inclusive, lower alkylthio of one to five carbon atoms, inclusive, phenylthio wherein phenyl is unsubstituted or substituted with one to three substituents, same or different, selected from the group consisting of halogen and lower alkyl of one to four carbon atoms, inclusive, monocyano substituted alkylthio of one to five carbon atoms, inclusive, cyano, alkoxy having one to five carbon atoms, inclusive, phenyl, and hydrogen, with the proviso that when A is hydrogen, B is of the formula:

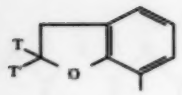


wherein R_5 is selected from the group consisting of alkyl of one to three carbon atoms, inclusive, and phenyl; R_6 is alkyl of one to three carbon atoms, inclusive, R_7 is selected from the group consisting of alkyl of one to three carbon atoms, inclusive, and SR_8, wherein R_8 is alkyl and is the same alkyl group as R_5, and taking R_5 and R_8 together with the atoms to which they are attached form a dithio heterocyclic of the formula:

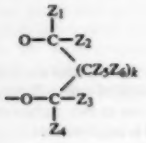


wherein n is 2 or 3 and the alkylene portion of the ring is unsubstituted or substituted with one or two methyl groups; A and B taken together with the carbon atoms to which they are attached form a dithio heterocyclic of the formula:

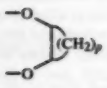
wherein m is 2 or 3 and the alkylene portion of the ring is unsubstituted or substituted with one to two methyl groups, and



wherein T and T' can be the same or different and are selected from the group consisting of hydrogen and lower alkyl of from one to six carbons; R_1 is selected from the group consisting of lower alkyl, phenyl, substituted phenyl, phenyl lower alkyl, and cyclo alkyl; X is oxygen or sulfur; Y and Y' are taken together to form a functionality selected from the group consisting of:

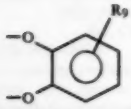


I'



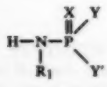
I''

and



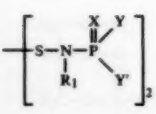
I'''

Z_1 through Z_6 are the same or different and are selected from the group consisting of hydrogen, methyl and ethyl, and k is 0 or 1; p is three or four, and R_9 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy and halogen; which comprises (1) contacting a compound having the formula:



VI

with the sulfur monochloride or sulfur monobromide, wherein R_1, X, Y and Y' are as defined above; (2) contacting the product of step 1 having the formula



V

with chlorine or bromine, and (3) contacting the product of step 2 with a compound having the formula

$$ROC(O)N(CH_3)H,$$

wherein R is the same as above.

4,426,336

PROCESS FOR THE PREPARATION OF VINYLPHOSPHONIC ACID DERIVATIVES AND THE USE THEREOF

Hans-Jerg Kleiner, Kronberg, and Walter Dürsch, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 297,736

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1980, 3033615

Int. Cl.³ C07F 9/30, 9/32

U.S. Cl. 260—986 8 Claims

1. A process for the preparation of vinylphosphonic acid derivatives from a 2-chloroethane phosphonic acid derivative having at least one 2-chloroethylester group, said process comprising:

heating a reaction medium comprising at least one 2-chloroethane phosphonic acid derivative containing at least one 2-chloroethyl ester group to a temperature of from 150° to 230° C. and splitting off 1,2-dichloroethane from said 2-chloroethanephosphonic acid derivative, thereby obtaining at least one vinyl phosphonic acid derivative having an unpolymerized vinyl group.

4,426,337

METHOD FOR PRODUCING SEAMLESS MATERIAL-FILLED CAPSULE AND MINIATURE CAPSULES

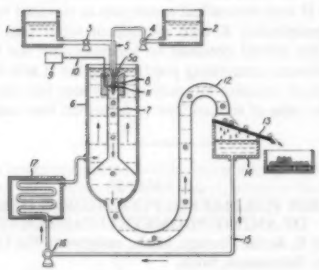
Toshiyuki Suzuki, Amagasaki; Funiaki Matsumura, Ya'o; Hiroshi Maeda, Sakai; Akira Imai, Higashi-Osaka, and Nobuo Kurokawa, Nara, all of Japan, assignors to Morishita Jintan Company, Limited, Osaka, Japan

Continuation of Ser. No. 170,964, Jul. 18, 1980, abandoned, which is a division of Ser. No. 962,043, Nov. 20, 1978, Pat. No. 4,251,195, which is a continuation of Ser. No. 749,755, Dec. 13, 1976, abandoned. This application Jul. 30, 1982, Ser. No. 403,715

Claims priority, application Japan, Dec. 26, 1975, 50-157935; Jun. 4, 1976, 51-65308; Jun. 4, 1976, 51-65309

Int. Cl.³ B29F 3/10; B29C 23/00

U.S. Cl. 264—4 8 Claims



1. A method for making miniature capsules comprising extruding filler-contents for capsules and deliverying the filler-contents as an extruded stream, extruding a film sleeve of a liquid settable coating material circumferentially of said extruded stream of filler-contents and in the same flow direction for coating and enclosing droplets of said filler-contents, flowing a flow of cooling liquid along a path of travel parallel to and circumferentially of said extruded stream of filler-contents and the film sleeve of the liquid settable coating material, reciprocating an annular member in the cooling liquid circumferentially of the film sleeve of liquid settable coating material and the extruded stream of filler-contents while in the path of travel wherein the cooling fluid, the extruded film sleeve and the extruded stream of filler-contents are flowing in parallel

and reciprocating the annular member in opposite directions axially of said path of travel to develop waves in said cooling liquid effective to develop discrete droplets of said filler-contents enclosed within the settable coating material, and setting the coating material enclosing the droplets of said filler-contents to form miniature capsules.

4,426,338

PROCESS FOR THE PRODUCTION OF U_3O_8 SINTERED BODIES

Karl-Gerhard Hackstein, Hanau; Milan Hrovat, Rodenbach; Hans Huschka, and Karl-Heinz Koch, both of Hanau, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Jun. 18, 1981, Ser. No. 274,793

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024634

Int. Cl.³ G21C *21/00*

U.S. Cl. 264—0.5 **14 Claims**

1. A process for the production of high density U_3O_8 sintered bodies of specific grain size suitable as fuel for the manufacture of plate shaped fuel elements for material test and research reactors comprising first mechanically compressing fine particle of still sinterable U_3O_8 powder to molded bodies, then grinding to form granulates having a particle size below 200μ and then sintering in air a temperature below 1500° C. to high density particles.

4,426,339

METHOD OF MAKING ELECTRICAL DEVICES COMPRISING CONDUCTIVE POLYMER COMPOSITIONS

Hundi P. Kamath, Foster City, and Jeffrey C. Leder, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 24,369, Mar. 27, 1979, abandoned, which is a continuation of Ser. No. 750,149, Dec. 13, 1976, abandoned. This application Apr. 7, 1981, Ser. No. 251,910

Int. Cl.³ B29F *3/10*

U.S. Cl. 264—22 **28 Claims**

1. A process for the preparation of an electrical device which has improved resistance stability under service conditions, which comprises at least two electrodes, each of said electrodes being in physical and electrical contact with a conductive polymer composition, and in which, when said electrodes are connected to a source of electrical power, current passes between the electrodes through the conductive polymer composition, which process comprises contacting each of said electrodes with conductive polymer composition by

(1) heating a thermoplastic electrically conductive polymer composition above its melting point;

(2) heating each electrode, in the absence of the conductive polymer composition, to a temperature above the melting point of the conductive polymer composition;

(3) (contacting) bringing each electrode which has been heated in step (2), while it is at a temperature above the melting point of the conductive polymer composition, into direct physical contact with the molten conductive polymer composition prepared in step (1); and

(4) cooling each electrode and conductive polymer composition in contact therewith prepared in step (3),

whereby the contact resistance between each of the electrodes and the conductive polymer in contact therewith is reduced.

4,426,340

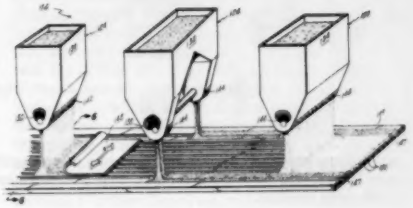
PROCESS FOR FABRICATING RIBBED ELECTRODE SUBSTRATES AND OTHER ARTICLES

Glen J. Goller, West Springfield, Mass.; Richard D. Breault, Coventry, Conn., and J. Harold Smith, Amherst, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 29, 1981, Ser. No. 306,836

Int. Cl.³ B29C *25/00*

U.S. Cl. 264—29.1 **29 Claims**



1. A process for forming porous, resin bonded carbon fiber articles, said articles having predefined areas with different preselected mean pore sizes, comprising the steps of:

selecting different dry mixtures of carbon fibers and thermosetting resin corresponding to each of said preselected mean pore sizes, each different mixture having substantially the same ratio of carbon to resin and a different carbon fiber average length to diameter ratio, the carbon fiber length to diameter ratio of each mixture being chosen to provide its respective mixture with carbon fibers having a preselected fiber bulk density;

depositing known quantities of each of the said different mixtures onto an article forming surface in a location corresponding to that predefined area of the article to which said mixture corresponds; and

heating and compacting the deposited material, comprising heating to a first temperature sufficient to melt the resin and compacting the deposited material to a preselected volume by pressing first surface means against said deposited material and maintaining the compacting pressure and the temperature of the material for a first length of time sufficient to effect bonding of the carbon fibers such that said preselected volume is retained after said pressure is removed;

wherein the preselected bulk densities of the carbon fibers in said mixtures are chosen such that, after said mixtures are subject to said step of heating and compacting, the resulting article will have the said preselected mean pore sizes in the predefined areas to which said mixtures correspond.

4,426,341

TRANSFER MOLDING METHOD AND TRANSFER MOLDING MACHINE

Susumu Tsuzuku, Tokyo; Aizo Kaneda; Junichi Saeki, both of Yokohama, and Masayoshi Aoki, Kamakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 191,299, Sep. 26, 1980, abandoned. This application Aug. 26, 1982, Ser. No. 411,759

Claims priority, application Japan, Sep. 28, 1979, 54-124033

Int. Cl.³ B29G *3/00*

U.S. Cl. 264—40.1 **6 Claims**

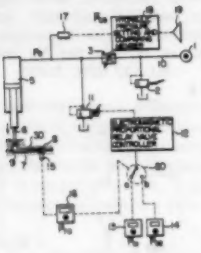
1. A method of transfer molding comprising the steps of:

(a) charging thermosetting resin into a mold having at least one runner and at least one cavity by applying pressure to the resin by a plunger;

(b) sensing the resin pressure in said mold by a resin pressure sensor; and

(c) controlling the pressure applied to the plunger during step (a) by applying a selected primary pressure to said plunger for driving said plunger until the pressure sensed

in step (b) reaches a predetermined level and directly switching the pressure applied to the plunger to a second-



ary holding pressure that is lower than said primary pressure for driving said plunger upon said predetermined level being reached.

4,426,342

PROCESS FOR TABLETING FINE POWDERS

Dennis E. Dria, Cleveland Hts., and Noel J. Bremer, Kent, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 18, 1981, Ser. No. 332,121
Int. Cl.³ B29J 5/00
U.S. Cl. 264—109 11 Claims

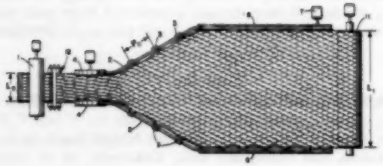
1. In a process for compressing a fine powder into a tablet wherein the powder is mixed with an agent to increase the binding and free flowing properties of the powder prior to compressing the tablet, the improvement wherein the agent is a liquid halogenated hydrocarbon or mixtures thereof.

4,426,343

PROCESS FOR PRODUCING COMPOSITE RETICULAR STRUCTURES

Andrea Vittone, Milan, and Edoardo Furia, Florence, both of Italy, assignors to Montedison S.p.A. and Moplefan S.p.A., both of Milan, Italy

Continuation of Ser. No. 150,708, May 19, 1980, abandoned.
This application Oct. 1, 1981, Ser. No. 307,624
Claims priority, application Italy, May 18, 1979, 22800 A/79
Int. Cl.³ B29C 17/14
U.S. Cl. 264—147 6 Claims



1. Process for the preparation in a continuous run of composite open-net shaped structures, consisting of at least two superimposed fibrilled films, said process consisting of the following operations:

(1) preparing a film formed of at least one synthetic polymer, having a thickness comprised between 35 and 1,200 microns;

(2) prevailingly longitudinal orientation of the film by a monoaxial stretching, with longitudinal drawing ratios comprised between 4 and 15, and with the formation of an oriented film having a thickness comprised between 15 and 200μ;

(3) fibrilling the film thus oriented by passing it on surfaces fitted with means for producing slits, with the formation of unfibrilled, oblique bands forming an angle β_o with the direction of the slits of the film, comprised between about 0.30° and about 50°;

(4) superimposing at least two films thus fibrilled with the crossing of the oblique bands of each film according to any desired angle;

(5) transversal stretching of the pack of superimposed films, thereby obtaining a rotation on the plane of the oblique unfibrilled bands of each film, until said bands form with the original slitting direction, a new angle β_t with a value comprised between β_o and ±80° with respect to the direction of slitting; and

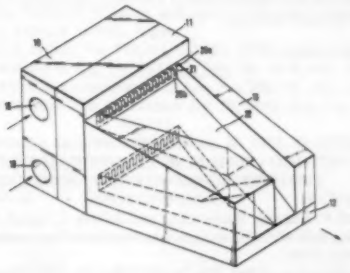
(6) thermostabilizing the assembly of stretched and superimposed films.

4,426,344

COEXTRUSION PROCESS AND APPARATUS FOR MANUFACTURING MULTI-LAYERED FLAT FILMS OF THERMOPLASTIC MATERIALS

Peter Dinter, Hallgarten, and Andreas Kolbe, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 280,334
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025564
Int. Cl.³ B29F 3/04
U.S. Cl. 264—171 17 Claims



1. A process for producing a multiple-layered sheet of film comprising at least two thermoplastic materials by coextrusion through a generally planar wide slot die, comprising the steps of:

heat plastifying a first, second, third and fourth thermoplastic material;

joining a stream of said first heat plastified thermoplastic material and a stream of said second heat plastified thermoplastic material to form a first combined stream having a generally rectangular cross-section and having an upper layer of said first thermoplastic material and a lower layer of said second thermoplastic material mechanically anchored together by means of profiles formed on the contact surfaces of the two layers, the width of said first combined stream being greater than one-half of the width of the inlet channel of the slot die;

joining a stream of said third heat plastified thermoplastic material and a stream of said fourth heat plastified thermoplastic material to form a second combined stream having a generally rectangular cross-section and having an upper layer of said third thermoplastic material and a lower layer of said fourth thermoplastic material mechanically anchored together by means of profiles formed on the contact surfaces of the two layers, the width of said second combined stream being greater than one-half of the width of the inlet channel of the slot die;

reducing the width of said first and second combined streams;

joining said first and second combined streams in edge-to-edge fashion in a single plane to form a composite stream;

introducing said composite stream into the inlet channel of the slot die;

coextruding the composite stream through the slot die to form a generally planar multiple layer film or sheet wider than said inlet channel; and

cooling the film or sheet.

16. An adapter apparatus for producing a multiple-layered sheet of film comprising at least two thermoplastic materials by coextrusion through a slot die, comprising:

means for joining a stream of a first heat plastified thermoplastic material and a stream of a second heat plastified thermoplastic material to form a first combined stream having a generally rectangular cross-section and having an upper layer of said first thermoplastic material and a lower layer of said second thermoplastic material mechanically anchored together by means of profiles formed on the contact surfaces of the two layers, the width of said first combined stream being greater than one-half of the width of the inlet channel of the slot extrusion die;

means for joining a stream of a third heat plastified material and a stream of a fourth heat plastified thermoplastic material to form a second combined stream having a generally rectangular cross-section and having an upper layer of said third thermoplastic material and a lower layer of said fourth thermoplastic material mechanically anchored together by means of profiles formed on the contact surfaces of the two layers, the width of said second combined stream being greater than one-half of the width of the inlet channel of the slot extrusion die;

means for reducing the width of said first and second combined streams;

means for joining said first and second combined streams in edge-to-edge fashion in a single plane to form a composite stream; and

means for introducing said composite stream into the inlet channel of the slot extrusion die.

4,426,345

PROCESS FOR OBTAINING REVOLVING BODIES FOR CONSTRUCTION FROM AGGREGATES AND A BINDER

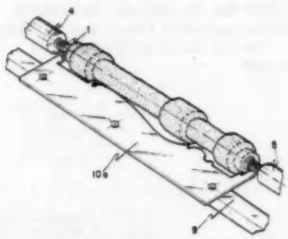
Francisco Serra Bou, Corazon de Maria, 10 Gerona, Spain

Filed Dec. 1, 1981, Ser. No. 326,674

Claims priority, application Spain, Dec. 11, 1980, 497,644

Int. Cl.³ B28B *1/16*

U.S. Cl. 264—256 **5 Claims**



1. A process for forming a baluster from aggregates and a binder, said process comprising:

providing a rigid longitudinal core;

forming on said core a cylindrical body of a mass of aggregate and binder thereby forming an assembly;

rotating the assembly of said core and body about the longitudinal axis of said core;

providing a first shaping member having an edge irregularly shaped to be complementary to a desired longitudinal profile to be imparted to said assembly;

positioning said first shaping member with said edge adjacent a surface of rotation of said body of said assembly;

applying a first mass of aggregate and binder to said surface of rotation such that said applied first mass rotates with said assembly and is shaped by said edge as said assembly rotates therepast, thereby forming a shaped assembly;

removing said first shaping member; positioning a second shaping member, having an edge irregularly shaped with a configuration different from that of said edge of said first shaping member and to be complementary to a further longitudinal profile to be imparted to said shaped assembly, with said edge of said second shaping member adjacent the surface of rotation of said shaped assembly; and

applying a second mass of aggregate and binder to said surface of rotation of said shaped assembly, said second mass having a finer granulometry than said first mass, such that said applied second mass rotates with said shaped assembly and is shaped by said edge of said second shaping member as said shaped assembly rotates therepast, thereby forming a further shaped assembly in the configuration of a baluster.

4,426,346

ORIENTED P-METHYL STYRENE POLYMER

S. Christine Ong, Somerville, and Margaret N. Bright, Jamesburg, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 190,535, Sep. 24, 1980, Pat. No. 4,347,344. This application Mar. 8, 1982, Ser. No. 355,428

Int. Cl.³ B29C *17/02*

U.S. Cl. 264—290.2 **5 Claims**

1. In the method of producing a solid film wherein a molten polymer is formed into a thin sheet and oriented by hot stretching above its glass transition temperature; the improvement which comprises employing as said polymer a thermoplastic high molecular weight polymer consisting essentially of poly(-para-methyl styrene).

4,426,347

METHOD OF MAKING COMPOSITE POLYOLEFIN BASED CONTAINERS

Stephen W. Cornell, 66 High Point Rd., and Don H. Johns, 20 Eno La., both of Westport, Conn. 06880

Filed Apr. 6, 1981, Ser. No. 251,581

Int. Cl.³ B29D *23/01*

U.S. Cl. 264—294 **9 Claims**

1. A process for the manufacture of polyolefin containers having substantially lowered permeability to oxygen and suitable for the packaging of foodstuffs requiring an extended shelf-life which comprises

polymerizing an olefin monomer in the presence of a solid material selected from the group consisting of vinylidene chloride polymers, acrylonitrile polymers, nylon and, vinyl alcohol polymers having a permeability to oxygen which is less than an olefin polymer to prepare an olefin polymer coated material,

forming a billet from the olefin polymer coated material and then compression molding the billet into a hollow container having walls formed from the olefin polymer coated material, which exhibit lowered permeability to the transmission of gases.

4,426,348

POLYURETHANE RIM SYSTEM

Wayne C. Salisbury, Middleton, N.H., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jul. 29, 1982, Ser. No. 402,871

Int. Cl.³ B29G *3/00*; B29D *27/00*

U.S. Cl. 264—328.6 **5 Claims**

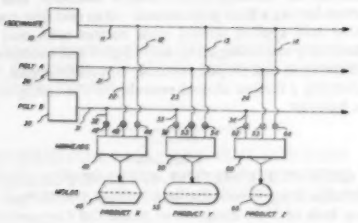
1. A polyurethane molding process having at least two

molding stations of a mixhead and a mold cavity fed thereby, said mold cavity being capable of repeated openings and closings, wherein the ingredients for a polyurethane forming composition are brought together in each said mixhead and rapidly injected into the mold cavity associated therewith to form a molded article, said ingredients including a long chain polyol, a chain extender, a crosslinker and an isocyanate; comprising:

(a) supplying each of said molding stations with said ingredients in at least three streams from a single source for each stream as follows:

(i) an isocyanate stream containing all of said isocyanate and free of reactive hydroxy and amino compounds,

(ii) a Polyol A stream free of said isocyanate and containing said chain extender and crosslinker, and some of said long chain polyol, and



(iii) a Polyol b stream containing said long chain polyol and free of said isocyanate, said chain extender and said crosslinker,

(b) controlling said ingredients supplied to one of said molding stations to have a relatively high ratio of said Polyol A stream to said Polyol B stream and to yield a molded product having a relatively low flex modulus;

(c) controlling said ingredients supplied to one other of said molding stations to have a relatively lower ratio of Polyol A stream and to yield a molded product having a relatively higher flex modulus, and

(d) allowing the ingredients injected into the mold cavities in steps (b) and (c) to go to completion and demolding the products.

4,426,349

PROCESS FOR IMPROVING DIMENSIONAL STABILITY OF VIDEO DISC CADDY

Thomas F. Kirschner, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,645

Int. Cl.³ B29C *25/00*

U.S. Cl. 264—346 **5 Claims**

1. A method of improving dimensional tolerances and stability of plastic video disc caddies which comprises

(1) inserting a flat plate in said caddy from its open side wherein said plate has a thickness at least that of the thickest part of said video disc,

(2) weighting said caddy to prevent bowing outwardly,

(3) heating said caddy at a temperature of from about 150°–175° F. for a time sufficient to stress-relieve the plastic of the caddy, and

(4) cooling to room temperature without removing said weight and said flat plate.

4,426,350

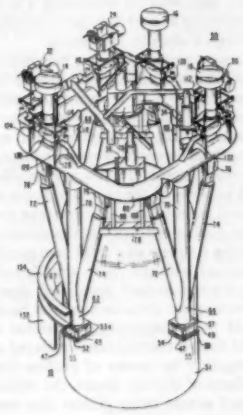
VALVE SUPPORT ARRANGEMENT FOR PRESSURIZER IN A NUCLEAR POWER PLANT

Martin J. Zegar, N. Huntingdon; Nicholas W. Kish, Munhall; Edward J. Rusnica, Greensburg; Howard S. Jenkins, Murrysville, and Stephen J. Sarver, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 29, 1981, Ser. No. 229,363

Int. Cl.³ G21C *9/00*

U.S. Cl. 376—283 **16 Claims**



1. An arrangement for supporting a plurality of steam discharge valves for connection to nozzles in the head of pressurizer in a nuclear power plant, said support arrangement comprising a common header having piping with a discharge outlet, means for supporting each of said valves relative to said header in a position proximate to the header piping, pipe means for connecting each of said valves to a pressurizer nozzle and to the header piping, means for securing said header to a side wall of the pressurizer vessel.

4,426,351

IRRADIATION HEAD FOR NEUTROTHERAPY APPARATUS

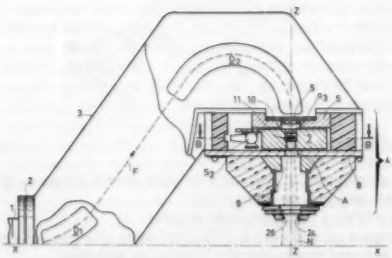
Hubert Leboutet, Buc, France, assignor to "C.G.R. MeV", Buc, France

Filed Sep. 18, 1980, Ser. No. 188,490

Claims priority, application France, Sep. 21, 1979, 79 23598

Int. Cl.³ G21K *5/10*; A61N *5/10*

U.S. Cl. 376—158 **3 Claims**



1. An irradiation head for a neurotherapy apparatus comprising:

means in said head for emitting an irradiating beam along a first axis, said means for emitting comprising

(a) a charged particle accelerator means for emitting a beam of charged particles,

(b) a fixed first target in the path of said charged particle beam, said target being constructed and adapted to emit an irradiating beam of neutrons along said first axis, under the impact of said charged particles, and

(c) collimator means along said first axis and in the path of said irradiating beam for focusing said irradiating beam;

positioning means in said head for positioning a second target relative to said beam, said positioning means comprising

(a) a turret positioned between said first target and said collimator, said turret being rotatable about a second axis parallel to said first axis, whereby selected portions of said turret intercept said first axis during rotation of said turret about said second axis,

(b) light emitting means mounted in one of said selected portions of said turret for emitting a light beam along said first axis,

(c) an X-ray source mounted in a second of said selected portions of said turret for emitting an X-ray beam along said first axis, said X-ray source being independent of said charged particle beam, and

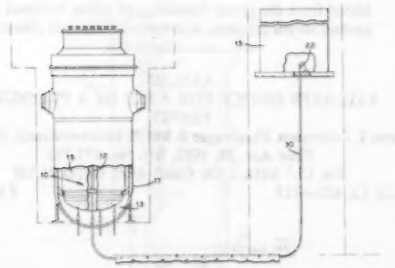
(d) means for rotating said turret, whereby said light emitting means and said X-ray source is sequentially and selectively be positioned along said first axis for providing both visual and X-ray positioning of said second target relative to said irradiating beam.

4,426,352

COMPOSITE DETECTOR

Richard T. Bybee; Arnold E. Paulson, and Holland D. Warren, all of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 14, 1980, Ser. No. 207,049
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—255 **4 Claims**



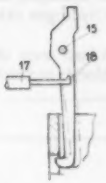
1. An apparatus for detecting and measuring nuclear flux density existing within a nuclear reactor, the apparatus comprising a plurality of pairs of detectors, each of said pairs comprises a prompt response detector having an emitter composed of hafnium and further comprises a delayed response detector, and both detectors of said pair are positioned within a nuclear reactor and juxtapositioned to sense the same neutron flux field so that the delayed response detector of said pairs may provide a continuous calibration signal to the corresponding prompt responding detector of said pairs.

4,426,353

DEVICE FOR THE DISENGAGEMENT OF A NUCLEAR REACTOR FUEL ELEMENT FROM AN ARTICULATED FINGER GRAPNEL AND METHOD OF USING SAME

Francis Chollet, Marly le Roi, France, assignor to Framatome, Courbevoie, France

Filed May 19, 1981, Ser. No. 265,020
Claims priority, application France, Jun. 12, 1980, 80 13084
Int. Cl.³ G21C *19/22*
U.S. Cl. 376—262 **6 Claims**



6. Method for disengaging a nuclear reactor fuel element from a grapnel having at least two articulated fingers, comprising the steps of

(a) positioning under water by means of a handling tool a device comprising means for adjusting the relative positions of said device and said grapnel-fuel element unit and for maintaining these positions, means for disengaging said fingers from the body of said grapnel, and means for tilting said fingers, said device being positioned on the tip of a duct for positioning a fuel element;

(b) introducing into said duct a fuel element to be disengaged from said grapnel;

(c) adjusting the relative positions of said disengaging device and said grapnel;

(d) successively driving out the axles from each of said fingers while simultaneously holding the latter by means of retaining feet;

(e) tilting each of said fingers by means of said feet in order to release the said element; and

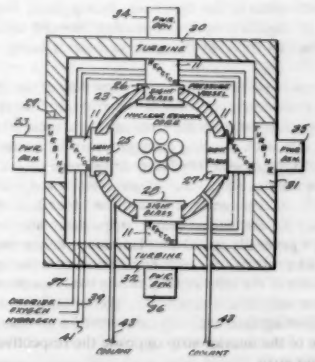
(f) raising said grapnel.

4,426,354

POWER GENERATOR SYSTEM FOR HCL REACTION

Robert L. Scragg, and Alfred B. Parker, both of Miami, Fla., assignors to Solar Reactor Corporation, Miami, Fla.

Filed May 1, 1978, Ser. No. 901,796
Int. Cl.³ G21D *7/04*
U.S. Cl. 376—320 **10 Claims**



1. A energy generation system comprising a reactor chamber,

means for controllably coupling chlorine and hydrogen to said reactor chamber,

a nuclear reactor core,

a housing for said nuclear reactor core, said housing being capable of withstanding the pressure generated inside thereof, said nuclear reactor core generating high frequency electromagnetic radiation,

means for directing at least a portion of said electromagnetic radiation into said reactor chamber, to thereby exothermically react said hydrogen and chlorine to generate highly charged particles and hydrogen chloride, said highly charged particles and hydrogen chloride having a high temperature, and

means for converting at least some of the energy of said generated hydrogen chloride and highly charged particles to mechanical energy.

4,426,355

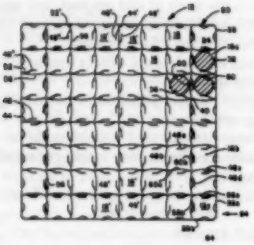
SPACER GRID FOR NUCLEAR FUEL ASSEMBLY

Joseph M. Burger, Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 4, 1982, Ser. No. 336,652

Int. Cl.³ G21C *3/34*

U.S. Cl. 376—442 **9 Claims**



1. A fuel assembly grid for supporting a rectangular array of nuclear fuel elements intermediate their ends, comprising:

four substantially solid perimeter plates forming a rigid quadrangle surrounding the fuel elements and having stop surfaces formed on the internal surfaces thereof for contacting each adjacent fuel element;

a plurality of interlaced strips attached to and extending from each plate to the oppositely facing plate, forming a lattice of regularly spaced openings through which the fuel elements traverse the grid, said strips being of two types;

the first type of said interlace strips consisting of two perpendicular center strips that divide the grid into four symmetric quadrants, each center strip having a spring tab projecting into each opening contiguous to the center strip;

the second type of said interlaced strips consisting of a plurality of interior strips, half of said interior strips oriented parallelly to one center strip and the other half oriented parallelly to the other center strip, each interior strip having a generally undulating bent stop surface such that one bend projects into each adjacent contiguous opening on the side of the interior strip facing the respective parallel center strip, and wherein each interior strip has a spring tab projecting into each adjacent contiguous opening on the side of the interior strip opposite the respective parallel center strip;

whereby every fuel element is resiliently supported within the grid, by two spring tabs and at least two stop surfaces.

4,426,356

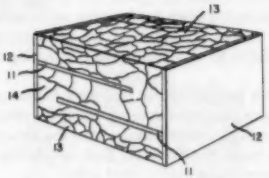
METHOD FOR MAKING CAPACITORS WITH NOBLE METAL ELECTRODES

Kumaran M. Nair, East Amherst, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1982, Ser. No. 430,872

Int. Cl.³ C22C *32/00*

U.S. Cl. 419—21 **7 Claims**



1. A metallization for the preparation of electrodes for monolithic capacitors which is a mixture of finely divided particles of (a) 70–99.5% by weight noble metal selected from the group consisting of silver, gold, palladium, platinum, and mixtures and alloys thereof, and (b) 30–0.5% by weight of an inorganic metal oxide selected from the group consisting of MoO_3, GeO_2, $Pb_5Ge_3O_{11}$, Nb_2O_5, ZnO, SnO_2, CdO, metal phosphates, metal fluorides, phosphate glasses, germanate glasses, fluoride glasses, borosilicate glasses and mixtures and precursors thereof.

4,426,357

ANTIBODY ELUTION REAGENT KIT

Sherry Buffington, Ringoes, and Leonard T. Wilson, Verona, both of N.J., assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed Sep. 9, 1981, Ser. No. 300,707

Int. Cl.³ G01N *33/54*

U.S. Cl. 422—61 **2 Claims**

1. A reagent kit for eluting, in the presence of heat and agitation, antibodies present on the surface of red blood cells consisting essentially of:

a first container containing an ester selected from the group consisting of sorbitan trioleate, sorbitan monoleate, and sorbitan monolaureate; and

a second container containing a red blood cell diluent selected from the group consisting of saline, buffered saline, bovine serum albumin, and buffered red cell diluent.

4,426,358

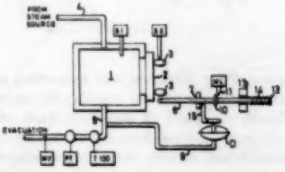
FAIL-SAFE DEVICE FOR A LID OF A PRESSURE VESSEL

Arne I. Johansson, Fägelvägen 5, 840 70 Hammarstrand, Sweden

Filed Apr. 28, 1982, Ser. No. 372,773

Int. Cl.³ A61L *2/06*; G05B *9/00*; G05D *16/00*

U.S. Cl. 422—112 **5 Claims**



1. In a fail-safe device for a lid of a pressure vessel having an evacuation conduit, said lid having a blocking mechanism for blocking said lid against opening as a result of internal pressure

in said vessel, said blocking mechanism being switchable from a blocking state to an unblocking state for enabling said lid to be opened, the improvement comprising

(a) a first sensor means for sensing that said blocking mechanism is in its blocking state, said first sensor means controlling an electrically operated valve in said evacuation conduit whereby to enable immediate depressurization of said pressure vessel upon indication by said first sensing means that said blocking mechanism is not in said blocking state;

(b) a first locking device switchable between a locking position for locking said blocking mechanism in said blocking state and an unlocking position in which said blocking mechanism is unlocked;

(c) a displacement device in communication with the interior of said vessel and coupled to displace said first locking device against resilient means into said locking position when a predetermined pressure prevails inside said vessel;

(d) a second sensor means for sensing a predetermined condition inside said vessel and for emitting an electrical signal at said condition;

(e) an electromechanical transducer coupled to receive said electrical signal for generating a force; and

(f) a second locking device coupled to said electromechanical transducer for moving into a locking position for locking said first locking device in its said locking position when receiving said force.

4,426,359

SOLIDS QUENCH BOILER

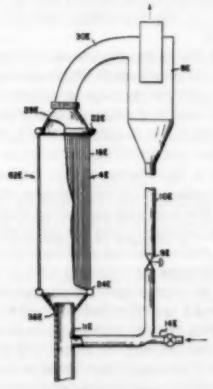
Herman N. Woebcke, Stamford, Conn.; Arju H. Bhojwani, Lawrenceville, N.J., and Robert J. Gartside, Auburndale, Mass., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Division of Ser. No. 165,784, Jul. 3, 1980, Pat. No. 4,356,651, which is a continuation-in-part of Ser. No. 82,162, Oct. 5, 1979, Pat. No. 4,351,275. This application Feb. 2, 1982, Ser. No. 345,100

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.³ F27B *15/16*; B01J *8/28, 8/30, 8/24*

U.S. Cl. 422—145 **2 Claims**



1. In a TRC apparatus having a reaction cracking chamber and means for quenching the cracked effluent and wherein the temperature in the cracking zone is between 1300° and 2500° F. and wherein the hydrocarbon feed or the hydrosulfurization residual oil along with the entrained inert solids and the diluent gas are passed through a cracking zone for a residence time of 0.05 to 2 seconds, and then quench cooled, the improvement wherein said means for quenching the effluent comprises:

(a) an indirect heat exchanger formed of an outer wall of longitudinally extending tubes joined together to form a pressure-tight membrane wall;

(b) a reactor effluent outlet tube connected to said reaction chamber and extending into the heat exchanger in communication with the hot side of the heat exchanger;

(c) particulate solids injection means connected to said reaction effluent outlet tube to deliver particulate solids into the effluent discharging from the reactor effluent outlet tube; and

(d) means to deliver steam to the tubes forming the outer wall of the heat exchanger.

4,426,360

THERMAL REGENERATION OUTLET BY-PASS SYSTEM AND PROCESS

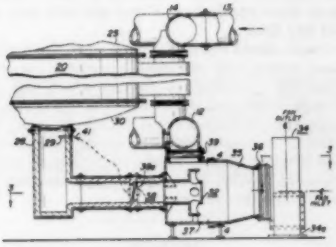
Edward H. Benedick, Morristown, N.J., assignor to Regenerative Environmental Equipment Co., Inc., Morris Plains, N.J.

Division of Ser. No. 55,908, Jul. 9, 1979, Pat. No. 4,302,426. This application Aug. 27, 1981, Ser. No. 296,799

The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.

Int. Cl.³ F01N *3/10*

U.S. Cl. 422—173 **10 Claims**



2. A process for controlling the temperature of industrial or commercial exhaust gases within a stationary fueled high-temperature heating zone in which a high temperature range is continuously produced, said zone communicating with a single heat-exchange zone having a plurality of solid heat exchange elements randomly disposed therein through which said gases normally pass when leaving said high-temperature zone on their way to the system exhaust via gas suction means located downstream of said heat-exchange zone, comprising the steps of:

(a) sensing directly at said high temperature zone a predetermined abnormally high temperature within said high temperature zone,

(b) in response only to the sensing of said abnormal temperature and as a direct function thereof, extracting a predetermined portion of the gases within said high temperature zone directly therefrom without thereafter passing through said single heat-exchange zone,

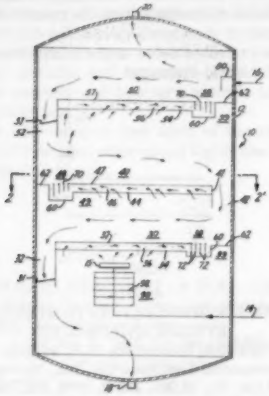
(c) mixing said extracted portion of gases with other gases which have left said high temperature zone via said single zone where they have been cooled by contact with said solid heat-exchange elements therein, and

(d) disposing of said mixed gases.

4,426,361
EXTRACTION ZONE TRAY

James D. Bushnell, Berkeley Heights, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 17, 1982, Ser. No. 450,682
Int. Cl.³ B01D *11/04*
U.S. Cl. 422—256 16 Claims



1. A tray means for a liquid-liquid extraction zone, said tray means comprising:

(A) a tray deck;

(B) a downcomer means disposed adjacent to said tray deck, said downcomer means adapted to pass a heavy phase liquid downwardly from above said tray deck to below said tray deck;

(C) a weir means disposed spaced apart from said downcomer means, said weir means adapted to disperse a light phase into a plurality of droplets which pass upwardly through the downwardly flowing heavy phase; and,

(D) a generally U-shaped channel means extending from said downcomer means to said weir means and communicating with said tray deck to form a fluid conduit, whereby the upwardly flowing light phase passes through the fluid conduit into the weir means.

4,426,362
SOLID BLOCK DETERGENT DISPENSER

James L. Copeland, Richfield; Peter J. Fernholz, Burnsville; Spencer B. Larson, Newport; Duane L. Salmonson, Cottage Grove, and Michael D. Weick, Eden Prairie, all of Minn., assignors to Economics Laboratory, Inc., Saint Paul, Minn.

Continuation of Ser. No. 211,411, Nov. 25, 1980, abandoned, which is a continuation of Ser. No. 966,620, Dec. 5, 1978, abandoned. This application Sep. 14, 1981, Ser. No. 301,746
Int. Cl.³ B01D *12/00*
U.S. Cl. 422—263 25 Claims

1. A dispenser for safely handling and dispensing solid block detergent compositions, comprising:

(a) a housing configured for fixed mounting to a solid surface, said housing defining a substantially enclosed inner cavity and access and discharge ports opening into said cavity;

(b) detergent containing cartridge means for providing safe operator handling of highly caustic solid block detergents, comprising:

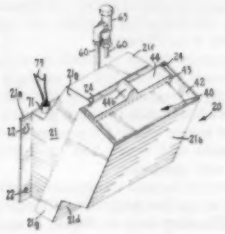
(i) a geometrically shaped solid block of highly caustic detergent;

(ii) means for fixedly containing said detergent block, so as to expose for use at least one broad surface of said block, positioned and dimensioned to enable an operator to readily and safely grasp and move said detergent block in loading and unloading manner without touching said detergent or residue formed therefrom; and

(iii) said detergent block and container means combination being dimensioned for rapid convenient insertion into said inner cavity;

(c) spray-forming nozzle means mounted to extend into said cavity for directing a pressurized fine spray of liquid; and

(d) cartridge positioning means in said housing for accepting said cartridge means inserted through said access port and



for releasably holding said inserted cartridge means in fixed predetermined position within said cavity in a manner directly and continuously exposing said broad detergent surface to said nozzle spray sufficiently so that the hydraulic action of said nozzle directed spray safely dissolves said detergent block through said exposed detergent surface in uniform controlled manner, forming a concentrated detergent solution for passage through said discharge port.

4,426,363
PROCESS FOR EXTRACTING ALUMINA FROM ALUMINOUS ORES

Koichi Yamada; Takuo Harato; Hisakatsu Kato, and Yasumi Shiozaki, all of Niihama, Japan, assignors to Sumitomo Aluminium Smelting Company, Ltd., Osaka, Japan

Filed Feb. 17, 1982, Ser. No. 349,666
Claims priority, application Japan, Feb. 27, 1981, 56/29154
Int. Cl.³ C01F *7/06*
U.S. Cl. 423—121 2 Claims

1. In a process for extracting alumina from aluminous ores containing mixtures of alumina trihydrate and alumina monohydrate which comprises the steps of: (a) a first-stage digestion by introducing a slurry of said ores and a portion of caustic solution into a tubular preheater, preheating individually the slurry and the other portion of caustic solution each in preheaters according to a two-stream system, mixing the preheated slurry with the preheated caustic solution, digesting alumina trihydrate from the ores and separating the slurry resulting after digestion of trihydrate into a caustic aluminate solution and an insoluble mud containing alumina monohydrate, and (b) a second-stage digestion by preparing a slurry of said insoluble mud containing alumina monohydrate separated in the first-stage digestion and a caustic solution, preheating the resulting slurry and digesting alumina monohydrate from the preheated slurry, the improvement wherein a desilication reaction zone is established in the first-stage digestion at a location following the inlet portion of the tubular preheater into which the slurry of said ores and a portion of caustic solution is introduced and before the step of separating the said slurry into caustic aluminate solution and insoluble mud, and carrying out the desilication reaction in said desilication reaction zone at a temperature of from about 130° C. to about 180° C. at a rentention time in said desilication reaction zone of from 20 to 120 minutes so that at least 50 weight % of reactive silica in the ores is converted into or deposited as a high-temperature desilication reaction product.

4,426,364

REMOVAL AND RECOVERY OF NITROGEN OXIDES AND SULFUR DIOXIDE FROM GASEOUS MIXTURES CONTAINING THEM

Hal B. H. Cooper, 4234 Chevy Chase Dr., La Canada Flintridge, Calif. 90017

Division of Ser. No. 925,850, Jul. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 714,793, Aug. 16, 1976, abandoned, and Ser. No. 823,051, Aug. 10, 1977, abandoned, and a continuation-in-part of Ser. No. 714,792, Aug. 16, 1976, abandoned, and Ser. No. 909,026, May 24, 1978, abandoned, which is a continuation of Ser. No. 812,814, Jul. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 714,792, Aug. 16, 1976, abandoned. This application Oct. 15, 1981, Ser. No. 311,521

Int. Cl.³ C01B *21/00, 17/00, 21/40*

U.S. Cl. 423—235 10 Claims

1. A process for removing oxides of nitrogen from a combustion gas mixture including carbon dioxide, nitric oxide and other oxides of nitrogen comprising:

(a) treating said gas mixture in a first zone by introducing to said zone an aqueous media which is a mixture of an acid and an oxidant, said acid being selected from the group consisting of sulfuric and nitric acids, and said oxidant being selected from the group consisting of hydrogen peroxide and peroxysulfuric acid;

(b) maintaining said oxidant in excess during said treating such that the ratio of said oxidant to nitric oxide, dinitrogen trioxide and nitrogen dioxide exceeds the stoichiometric amount needed to convert said lower valence oxides of nitrogen to nitric acid;

(c) forming a product aqueous media which includes nitric acid and recycling a portion of the product aqueous media to said first zone of gas treating;

(d) treating said gas stream in a second zone with an aqueous alkaline media which includes the carbonate-bicarbonate of an alkali metal which is in stoichiometric excess to the nitrogen oxides and nitric acid in the gas stream to form a second zone product aqueous media which includes alkali metal nitrate, alkali metal nitrite and alkali metal bicarbonate-carbonate; then

(e) lowering the pH of the product aqueous media from Step (d) so that it is less than pH=9.0 by addition of carbon dioxide or nitric acid and adding hydrogen peroxide to convert at least a portion of the alkali metal nitrite to alkali metal nitrate;

(f) crystallizing and recovering alkali metal nitrate from the product aqueous media from Step (e) in the presence of alkali metal carbonate-bicarbonate; and

(g) recycling the product aqueous media from Step (f) to said second zone of gas treating.

4,426,365

METHOD FOR REMOVING NITROGEN OXIDES FROM GAS STREAMS AND REGENERATING SPENT SORBENT

Jules Magder, Princeton, N.J., assignor to Noxso Corporation, Reston, Va.

Division of Ser. No. 144,078, Apr. 28, 1980, Pat. No. 4,323,544, which is a continuation of Ser. No. 54,337, Jul. 2, 1979, which is a continuation of Ser. No. 945,769, Sep. 25, 1978, abandoned, which is a continuation of Ser. No. 871,920, Jan. 23, 1978, abandoned, which is a continuation of Ser. No. 745,944, Nov. 29, 1976, abandoned, which is a continuation of Ser. No. 625,275, Oct. 23, 1975, abandoned, which is a continuation of Ser. No. 444,191, Feb. 15, 1974, abandoned, Division of Ser. No. 263,483, Jun. 16, 1972, abandoned. This application Mar. 31, 1981, Ser. No. 258,187

Int. Cl.³ B01J *8/00;* C01B *21/00*

U.S. Cl. 423—239 13 Claims

1. A method for the removal of nitrogen oxides from a gas containing them which method comprises contacting said gas at a temperature of 85° C. to about 200° C. with a sorbent, which sorbent comprises (a) an alumina component comprising alumina having a surface area of at least about 20 square meters per gram, and (b) an alkaline component comprising at least one salt of a Group IA the alkali metals or IIA the alkaline earth metals of atomic number not exceeding 56 and thereafter removing nitrogen oxides from said sorbent by a process which comprises: (c) contacting said nitrogen oxide containing sorbent in a regeneration zone where the regenerant gas stream containing at least 0.01 atmosphere partial pressure of hydrogen sulfide at a temperature of about 350 to about 750° C. for a period of time sufficient to recover a substantial portion of the sorbent's capacity for nitrogen oxide sorption; and (d) withdrawing nitrogen oxide formerly contained on said sorbent in a form of elemental nitrogen.

4,426,366

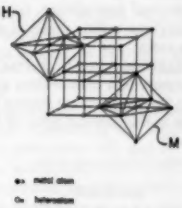
NOVEL MOLYBDENUM OXYCARBONITRIDE COMPOSITIONS

Larry E. McCandlish, Highland Park, and Larissa W. Turaew, Fairlawn, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 209,998, Nov. 24, 1980. This application Apr. 28, 1982, Ser. No. 372,486

Int. Cl.³ C01C *3/00*

U.S. Cl. 423—365 2 Claims



1. A composition of matter consisting essentially of amorphous molybdenum oxycarbonitride which has been produced by the thermal decomposition of an amine molybdate.

2. The composition of claim 1 which, when heated, forms crystalline molybdenum oxycarbonitride possessing a face-centered cubic structure, as evidenced by powder x-ray diffractometry.

4,426,367

FIXATION OF NITROGEN IN THE PRESENCE OF WATER VAPOR

Paul Harteck, Santa Barbara, Calif., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Apr. 14, 1982, Ser. No. 368,049

The portion of the term of this patent subsequent to Jun. 2, 1999, has been disclaimed.

Int. Cl.³ C01B *21/48*

U.S. Cl. 423—395 9 Claims

1. A process for the fixation of nitrogen comprising:

combining gaseous nitrogen and oxygen at a total pressure of above 100 atmospheres and at a working pressure range, with a metal oxide and at least 0.5% by weight water;

providing a catalyst with the gaseous nitrogen and oxygen, metal oxide and water, the water acting to increase the activity of the catalyst;

initially heating the combination to a working temperature range sufficient to form a nitrate and below the dissociation pressure of the nitrate corresponding to the working temperature and pressure ranges; and

thermally insulating the reaction to maintain the working temperature range;

the temperature range being between 500° and 800° C. and near thermal equilibrium for the nitrogen and oxygen to nitrogen oxide's reaction.

6. A process for the fixation of nitrogen comprising:

combining gaseous nitrogen and oxygen at a total pressure of above 100 atmospheres and a working pressure range, with a metal oxide;

providing an alumina-silicate molecular sieve catalyst base as a cite for the nitrogen fixation process; and

initially heating the combination to a working temperature range sufficient to form a nitrate and below the dissociation pressure of the nitrate corresponding to the working temperature and pressure range;

the temperature range being between 500° and 800° C. and near thermal equilibrium for a nitrogen and oxygen to nitrogen oxide's reaction.

4,426,368

METHOD OF PRODUCING GLASS CARBON

Ferdinand Quella, Gauting, and Hans-Friedrich Schmidt, Eurasburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 28, 1983, Ser. No. 461,982

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210878

Int. Cl.³ C01B *31/02*; C09C *1/48*; D01F *9/14*

U.S. Cl. 423—445 **14 Claims**

1. A method for producing glass carbon by thermal degradation of aromatic organic compounds which exhibit cross-linking properties upon thermal degradation, comprising:

admixing a polyphenylene sulfide material with an oxide of a sulfide-forming metal; and

subjecting the resultant admixture to thermal degradation by heating said admixture to a temperature above about 150° C. and increasing the temperature during the degradation process nearly up to the melting point of the polyphenylene sulfide material.

4,426,369

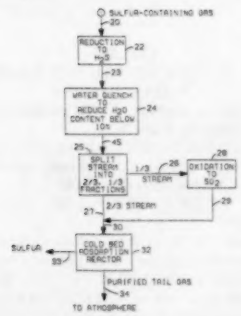
LOW TEMPERATURE CLAUS PROCESS WITH WATER REMOVAL

John W. Palm, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 239,772, Mar. 2, 1981, abandoned. This application Jan. 28, 1982, Ser. No. 343,662

Int. Cl.³ C01B *17/04*; B01J *8/04*

U.S. Cl. 423—574 R **4 Claims**



1. A method of treating an effluent tail gas stream from a final reactor in a Claus plant, the stream comprising a mixture of water and sulfur-containing compounds including hydrogen sulfide and sulfur dioxide, the method comprising:

(a) converting substantially all sulfur containing compounds of the tail gas stream to sulfur dioxide;

(b) reducing water content of the thus produced stream to produce a dried stream;

(c) creating a 2:1 molar ratio gaseous reaction mixture of hydrogen sulfide to sulfur dioxide in the dried stream; and

(d) catalytically converting the gaseous reaction mixture in the thus produced stream to water and sulfur by additional Claus conversion under low temperature and low water vapor conditions, the temperature being such that sulfur deposits on the catalyst.

4,426,370

METHOD FOR THE PREPARATION OF DEUTERIUM-ENRICHED WATER IN THE PREPARATION OF HYDROGEN

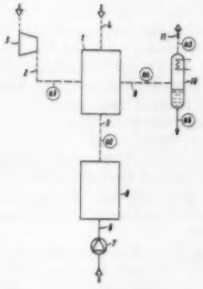
Charles Mandrin, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 13, 1981, Ser. No. 292,415

Claims priority, application Switzerland, Jan. 9, 1980, 6570/80

Int. Cl.³ C01B *5/00*

U.S. Cl. 423—580 H **13 Claims**



1. A method for the preparation of deuterium-enriched water, said method comprising the steps of

supplying a carbonaceous feedstock selected from the group consisting of carbon and at least one hydrocarbon, and at least one of water and steam in excess to a hydrogen production plant for obtaining synthesis gas,

operating the plant during at least two operating periods;

separating an effluent from the plant into a gaseous component and a liquid component consisting of deuterium-enriched water during each operating period;

isolating the deuterium-enriched water during each operating period;

thereafter introducing the deuterium-enriched water into the plant during the next operating period of shorter duration;

contacting the deuterium-enriched water in the plant during said next period with carbonaceous feedstock;

repeating this procedure during all subsequent periods except the last one;

separating an effluent from the plant during the last period into a liquid component consisting of a deuterium-enriched water and a gaseous component; and

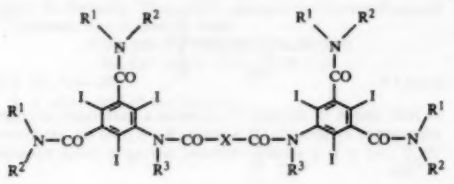
supplying the liquid component obtained during said last period to a plant for production of heavy water.

4,426,371
NOVEL N-HYDROXYALKYLATED DICARBOXYLIC ACID BIS(3,5-DICARBAMOYL-2,4,6-TRIIODOANILIDES), AS X-RAY CONTRAST MEDIA

Heinrich Pfeiffer, and Ulrich Speck, both of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Aug. 12, 1981, Ser. No. 292,115
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038853
Int. Cl.³ A61K *49/04, 31/165*
U.S. Cl. 424—5 19 Claims

1. An N-Hydroxyalkylated dicarboxylic acid bis (3,5-dicarbamoyl-2,4,6-triiodoanilide) of the formula



wherein

R^1 is C_{2-8}-, mono- or polyhydroxyalkyl,

R^2 is hydrogen, C_{1-4}-alkyl, or R^1,

R^3 is C_{2-3}-mono- or dihydroxyalkyl, and

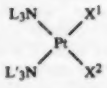
X is a direct bond or linear or branched alkylene of 1–6 C-atoms, optionally interrupted by 1–3 oxa atoms separated from each other by at least two methylene groups and from the ends of the alkylene group by at least one methylene group or substituted by 1–4 hydroxy or C_{1-2}-alkoxy groups.

4,426,372
INHIBITION OF UNDESIRED EFFECTS OF PLATINUM(II) COMPOUNDS

Richard F. Borch, Minneapolis, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Aug. 8, 1980, Ser. No. 176,476
Int. Cl.³ A61K *31/28*
U.S. Cl. 424—10 12 Claims

1. A method for inhibiting platinum (II) toxicity in a live mammal being treated with a physiologically active but toxic platinum (II) complex of the formula



wherein

X^1 and X^2 are the same or different and represent anionically ionizable leaving groups or, taken together, X^1 and X^2 can constitute a cyclic difunctional leaving group; and L_3 and L_3' are the same or different and represent the residues of ammine or amine ligands, or, in combination, L_3 and L_3' together represent the residue of an aliphatic or cycloaliphatic diamine ligand;

said method comprising the steps of:

(a) administering to said mammal a said platinum (II) complex in a physiologically active amount less than the median lethal dose for said mammal;

(b) administering to said mammal, within about 6 hours, but at least 0.5 hours after said step (a), an effective platinum (II) toxicity inhibiting amount of disulfiram or di(lower alkyl) dithiocarbamate, the lower alkyl groups of said dithiocarbamate having up to six carbon atoms.

4,426,373
SMOOTH DENTAL CREAM

Anthony J. Morton, Ashton under Lyne, and Kenneth Harvey, Wilmslow, both of England, assignors to Colgate-Palmolive Co., New York, N.Y.

Filed Sep. 14, 1982, Ser. No. 417,941
Int. Cl.³ A61K *7/16, 7/18*
U.S. Cl. 424—52 11 Claims

1. A dental cream which has a smooth surface and is free from formation of a tail upon extrusion comprising a dental vehicle comprising about 20–80% by weight based on the weight of the dental cream of a liquid phase containing water, humectant or mixture thereof and about 0.5–5% by weight based on the weight of the dental cream of a gelling agent containing sodium carboxymethyl cellulose having a viscosity of at least about 300 cps and hydroxyethyl cellulose having a viscosity of at least about 3000 cps, each being present in a weight ratio of about 3:2 to 2:3 with regard to the other, said viscosity being determined on a Brookfield Viscometer in 2% by weight aqueous solution at 25° C.

4,426,374
SUNSCREEN FORMULATION

William B. Wheeler, 1202 Hawthorne La., Burlington, N.C. 27215

Continuation of Ser. No. 780,570, Mar. 23, 1977, abandoned, which is a continuation of Ser. No. 475,618, Jun. 3, 1974, abandoned. This application Jan. 12, 1981, Ser. No. 224,457
Int. Cl.³ A61K *7/44*
U.S. Cl. 424—60 5 Claims

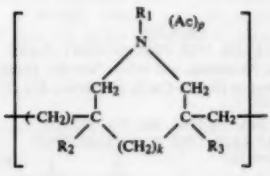
1. A sunscreen composition having improved adhesion in the presence of water comprising an ultraviolet light absorbing compound and a halocarbon oil, said oil being of the formula $-(CF_2CFCl)_n-$ and having a pour point of between −110° F. to +65° F. as measured by ASTM D97-67 Procedure.

4,426,375
COSMETIC COMPOSITIONS FOR THE HAIR AND THE SKIN BASED ON POLYMERS WHICH CONTAIN AMINO GROUPS AND RECURRING UNITS HAVING A CYCLIC STRUCTURE

Bernard Jacquet, Antony; Christos Papantoniou, Montmorency, and Jean Mondet, Sevran, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 944,140, Sep. 20, 1978, Pat. No. 4,287,720. This application Jun. 22, 1981, Ser. No. 276,193
Claims priority, application Luxembourg, Sep. 23, 1977, 78170
Int. Cl.³ A61K *7/06, 7/09*
U.S. Cl. 424—70 8 Claims

1. A cosmetic composition to improve the suppleness and sheen of the hair and to facilitate the hydration and softness of the skin comprising a cosmetic vehicle suitable for application to the hair or skin and from 0.01 to 15% by weight of said composition of a polymer consisting essentially of recurring units of the formula:


(Ia)

wherein:

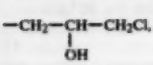
k is 0 or 1, and l is 1 if k=0, or l is 0 if k=1,

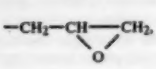
p=0 or 1,

R_2 and R_3 each independently represent hydrogen or methyl,

R_1 represents a member selected from the group consisting of

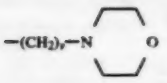
(i) $-CH_2-COOR_6$ wherein R_6 represents alkyl having 1–3 carbon atoms,


(ii)

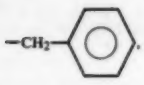

(iii)

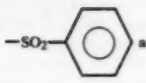
(iv) $-(CH_2)_v-CN$ wherein v is 1 or 2,

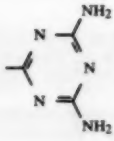
(v) $-COR_7$ wherein R_7 is selected from the group consisting of alkyl having 1–3 carbon atoms, $-CCl_3$, $-CH_2Cl$, phenyl and



wherein v is 1 or 2,


(vi)


(vii) and


(viii)

and Ac if p is 1 is selected from the group consisting of hydrochloric acid, hydrobromic acid, nitric acid, acetic acid, butyric acid and lactic acid, said polymer having a molecular weight ranging from 2,000 to 500,000.

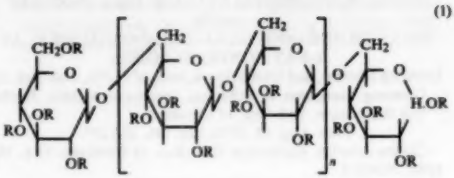
4,426,376

NEUTRALIZER FOR PERMANENT WAVE

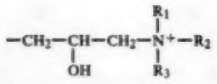
Sachiko Shirakura, Shinbashi, and Hiroo Namiki, Hanno, both of Japan, assignors to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Jan. 28, 1982, Ser. No. 343,528
Int. Cl.³ A61K *7/09, 7/11;* **C08B** *37/02*
U.S. Cl. 424—71 **9 Claims**

1. A neutralizer for permanent wave processing comprising 0.5–16% (w/v) of (A) and 0.1–5% (w/v) of B as indispensible components, where (A) denotes an oxidizing agent capable of reforming ruptured disulfide bonds in reduced hair and (B) denotes a cationic dextran derivative or its salt represented by formula (1)


(1)

wherein R is selected from the group consisting of hydrogen and a quaternary nitrogen-containing group represented by formula (2)


(2)

at least one R of formula (1) contains a quaternary nitrogen represented by formula (2), wherein R_1, R_2 and R_3, are lower-alkyl, and n is a positive number having a value between 1–8000.

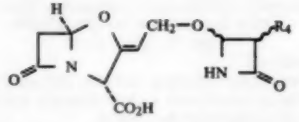
4,426,377

CLAVULANIC ACID DERIVATIVES THEIR PREPARATION AND USE

Thomas T. Howarth, Reigate, England, assignor to Beecham Group Limited, England

Division of Ser. No. 942,410, Sep. 14, 1978, Pat. No. 4,215,128. This application Apr. 11, 1980, Ser. No. 139,585
Claims priority, application United Kingdom, Sep. 20, 1977, 39040/77; Sep. 21, 1977, 39251/77; Aug. 25, 1978, 34593/78
Int. Cl.³ A61K *35/00*
U.S. Cl. 424—114 **78 Claims**

1. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises a synergistically effective amount of a compound of the formula (IV):



a pharmaceutically acceptable salt thereof, or an in vivo hydrolyzable ester thereof, wherein R_4 is hydrogen or $NH.CO.R_5$ wherein R_5 is lower alkyl, lower alkoxy, lower alkoxy lower alkyl, aryl, aryloxy, aralkyl or aryloxyalkyl, and an antibacterially effective amount of a penicillin, in combination with a pharmaceutically acceptable carrier.

4,426,378

THYROTROPIN RELEASING HORMONE IN THERAPY OF SHOCK AND AS A CENTRAL NERVOUS SYSTEM STIMULANT

John W. Holaday, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 9, 1981, Ser. No. 252,443
Int. Cl.³ A61K *37/24;* **C07C** *103/52;* **C07G** *7/00*
U.S. Cl. 424—177 **17 Claims**

1. A method of antagonizing non-analgesic side effects of exogenous opiates as hypotension, hypothermia, emesis, diminution of gastric motility, pupil constriction, depressed respiratory function in animals which have been treated with one or more opiates which comprises concurrently administering intraveneously to the animal a therapeutically effective amount

of a drug selected from the group consisting of Thyrotropin Releasing Hormone (L-pyroglutamyl-1-histidyl-L-proline amide), a derivative of Thyrotropin Releasing Hormone (L-pyroglutamyl-1-histidyl-L-proline amide), and a pharmaceutically-acceptable salt thereof, in combination with an opiate drug.

4,426,379

INSECTICIDAL 2-OXO-3-DIALKOXYPHOSPHORO-5-CYCLOPROPYL-1,3,4-OXADIAZOLINE

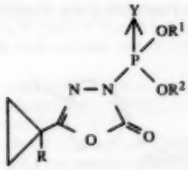
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 27, 1982, Ser. No. 343,088

Int. Cl.³ A01N *57/32*; C07F *9/65*

U.S. Cl. 424—200 **9 Claims**

1. A compound of the formula



where R is hydrogen, lower alkyl or lower alkoxy, R^1 and R^2 are independently lower alkyl and Y is either oxygen or sulfur.

6. A method of killing insects comprising contacting said insects or their habitats with an insecticidally effective amount of a compound of the formula defined in claim 1.

4,426,380

BENZOFURAN-2-ONES AND PHARMACEUTICAL COMPOSITIONS

Paul Wenk, Allschwil; Werner Breitenstein, and Marcus Baumann, both of Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

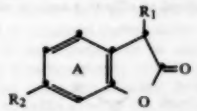
Filed Oct. 21, 1982, Ser. No. 435,595

Claims priority, application Switzerland, Oct. 28, 1981, 6882/81

Int. Cl.³ A61K *31/40, 31/535*; C07D *405/02, 413/02*

U.S. Cl. 424—244 **12 Claims**

1. Benzofuranones of the general formula



(I)

in which R_1 represents hydrogen or an aliphatic radical, R_2 represents an amino group di-substituted by a divalent hydrocarbon radical, and the aromatic ring A may be additionally substituted, and their salts and/or isomers.

12. Pharmaceutical preparations containing a compound according to any one of claims 1-11, in addition to pharmaceutical adjuncts and carriers.

4,426,381

CARBOXYLIC ACID DERIVATIVES

Shingo Matsumura, deceased, late of Kyoto by Rumiko Matsumura, legal representative; Masahiro Kise, Kyoto; Masakuni Ozaki, Joyo; Shinichi Tada, Omiyawata; Kenji Kazuno, Shiga; Hisao Watanabe, Kyoto; Katsutoshi Kunimoto, Shiga, and Masami Tsuda, Kyoto, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Kyoto, Japan

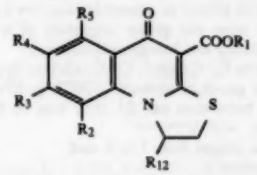
Filed Feb. 12, 1982, Ser. No. 348,184

Claims priority, application Japan, Feb. 18, 1981, 56-23582

Int. Cl.³ C07D *475/00*; A61K *31/495*

U.S. Cl. 424—250 **14 Claims**

1. A compound of the formula



in which:

R_1 is hydrogen, alkali metal, alkali earth metal, lower alkyl or pivaloyloxymethyl;

R_2 is hydrogen or halogen;

R_3 is hydrogen, halogen or piperazinyl unsubstituted or substituted by lower alkyl, (hydroxy)lower alkyl, (lower alkoxy)(hydroxy)lower alkyl, or phthalidyl;

R_4 is hydrogen, halogen or lower alkoxy; or

R_3 and R_4 together with the carbon atoms to which they are attached form a 5, 6 or 7-membered ring containing carbon atoms and 1 or 2 oxygen atoms;

R_5 is hydrogen, halogen or piperazinyl unsubstituted or substituted by lower alkyl, hydroxy(lower alkyl) or (lower alkoxy)(hydroxy) lower alkyl, or phthalidyl; and

R_{12} is hydrogen or lower alkyl; provided that at least one of R_3 and R_5 is said unsubstituted or substituted piperazinyl, and pharmaceutically acceptable acid addition salts thereof.

4,426,382

4-AMINO-6,7-DIMETHOXY-2-PIPERAZINYLQUINAZOLINE DERIVATIVES, THEIR PREPARATION AND USE

Yasunobu Sato; Hiroshi Fukumi; Hiroyuki Koike, and Hiroshi Nishino, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

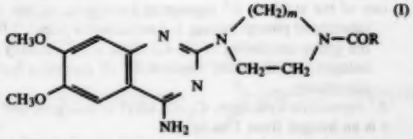
Filed Feb. 11, 1981, Ser. No. 233,679

Claims priority, application Japan, Feb. 13, 1980, 55-16775; Apr. 21, 1980, 55-52754; Jul. 14, 1980, 55-96106; Jul. 14, 1980, 55-96107

Int. Cl.³ A61K *31/505*; C07D *403/04*

U.S. Cl. 424—251 **50 Claims**

36. A pharmaceutical composition comprising, as the active ingredient, a hypotensively effective amount of a hypotensive compound in admixture with a pharmaceutically acceptable carrier or diluent, wherein said hypotensive compound is selected from the group consisting of compounds of formula (I):

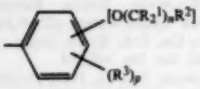


(I)

in which:

m is 2 or 3, and

R represents a group of formula:



wherein

R^1 represents hydrogen, or C_1–C_3 alkyl and the two R^1 groups may be the same or different;

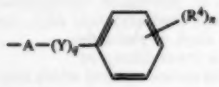
R^2 represents phenyl or phenyl having 1 to 3 substituents selected from the group consisting of C_1–C_3 alkyl, C_1–C_3 alkoxy and halogen substituents;

R^3 represents C_1–C_3 alkyl, C_1–C_3 alkoxy, hydroxy, halogen or a group of formula—$(O(CR^1_2)_nR^2)$ and, when there is more than one R^3, they may be the same or different;

n is 0 or an integer from 1 to 3; and

p is 0, 1 or 2;

a group of formula:



wherein

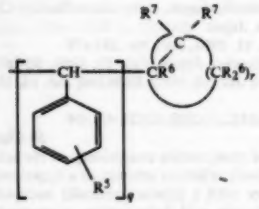
A represents C_1–C_6 straight or branched alkylene;

Y represents oxygen or sulphur;

q is 0 or 1;

R^4 represents C_1–C_3 alkyl, hydroxy, C_1–C_3 alkoxy, halogen, amino, or an amino substituted with one or two substituents selected from the group consisting of C_1–C_3 alkyl and C_1–C_3 aliphatic acyl substituents;

or a group of formula:



wherein

R^5 represents hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy or halogen;

one of the symbols R^6 represents hydrogen, phenyl or a substituted phenyl having 1–3 substituents selected from the group consisting of C_1–C_3 alkyl, C_1–C_3 alkoxy and halogen and the other symbols R^6 all represent hydrogen atoms;

R^7 represents hydrogen, C_1–C_3 alkyl or halogen; and

r is an integer from 1 to 5;

provided that, when q is 0, one of the symbols R^6 represents said substituted or unsubstituted phenyl,

and pharmaceutically acceptable acid addition salts thereof.

4,426,383

THEOPHYLLINE AND THEOBROMINE DERIVATIVES

Hachiro Sugimoto, Kawaguchi; Takaharu Nakamura, Abiko; Sachiyuki Hamazo, Tokyo; Toshiji Igarashi, Saitama, and Yoshiharu Daiku, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

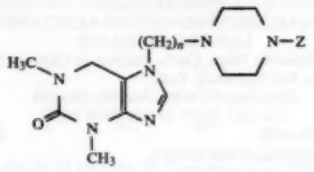
Filed Aug. 31, 1981, Ser. No. 298,227

Claims priority, application Japan, Sep. 4, 1980, 55-121712; Sep. 4, 1980, 55-121713

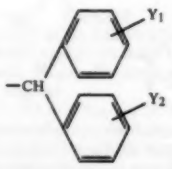
Int. Cl.³ C07D *473/08, 473/10;* **A61K** *31/52*

U.S. Cl. 424—253 **15 Claims**

1. A compound having the formula



wherein Z is selected from the group consisting of (a) pyridyl and (b)



in which Y_1 and Y_2, which are the same or different, are hydrogen, lower alkyl, lower alkoxy, trifluoromethyl or halogen; and n is an integer of from 2 to 10; or a pharmaceutically acceptable salt thereof.

4,426,384

TREATMENT OF RHEUMATOID ARTHRITIS AND RELATED DISEASES

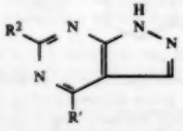
Roger Wyburn-Mason, Richmond, England, assignor to John R. A. Simoons, Durham, N.C.

Filed Aug. 5, 1982, Ser. No. 405,439

Int. Cl.³ A61K *31/52, 31/505*

U.S. Cl. 424—253 **4 Claims**

1. A method for producing remission in patients suffering from active rheumatoid arthritis which comprises administering orally to such a patient an effective amount of a compound of the formula:



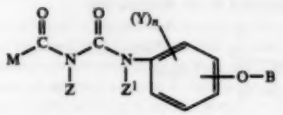
wherein R' is amino, hydroxy or mercapto and R^2 is hydrogen, mercapto or hydroxyl and the pharmaceutically acceptable acid addition salt thereof.

4,426,385
INSECTICIDAL BICYCLOOXYPHENYL UREAS

Paul A. Cain, Dunbar, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 197,595, Oct. 16, 1980, abandoned. This application Sep. 28, 1981, Ser. No. 305,951
Int. Cl.³ C07C 127/22; C07D 221/00, 307/83; A01N 9/20
U.S. Cl. 424—263 84 Claims

1. A composition of the formula:



wherein M represents a monocyclic aromatic ring system or a monocyclic heterocyclic ring system containing up to 2 nitrogen atoms, and wherein the ring can contain up to four X substituents wherein each X individually can be halogen, nitro, cyano, or alkyl, polyhaloalkyl, alkoxy or polyhaloalkoxy of from 1 to 3 carbon atoms;

Z and Z^1 individually are hydrogen or alkyl of from 1 to 8 carbon atoms, or alkyl of from 1 to 8 carbon atoms which is substituted with at least one of halogen, hydroxyl or alkoxy;

Y individually represents halogen, or alkyl, polyhaloalkyl, alkoxy or polyhaloalkoxy of from 1 to 3 carbon atoms, and n has a value of from 0 to 4;

B is a bicyclic fused ring system which is attached to the oxygen through a carbocyclic ring and wherein (a) at least one ring is a six-membered, unsaturated carbocyclic ring which can contain up to two R and R^1 substituents wherein R and R^1 can be halogen, nitro, cyano, amino, formamido, formamidino, phenylsulfenyl, phenylsulfinyl, phenylsulfonyl, phenylsulfamido wherein the phenyl ring optionally may be substituted with one or more halogen, nitro, or alkyl, polyhaloalkyl, alkoxy or polyhaloalkoxy of from 1 to 3 carbon atoms, or R and R^1 individually are alkyl, alkoxy, polyhaloalkyl, polyhaloalkoxy, alkenyloxy, polyhaloalkenyloxy, alkynyloxy, polyhaloalkynyloxy, alkylsulfenyl, poyhaloalkylsulfenyl, alkylsulfinyl, polyhaloalkylsulfinyl, alkylsulfonyl, polyhaloalkylsulfonyl, mono- or di-alkylsulfamido, mono- or di-alkylamino, alkylcarbonylamino, alkoxycarbonylamino, mono- or di-alkylaminocarbonyloxy of up to 6 carbon atoms, and (b) the second ring, hereinafter also referred to as A, when it is not a five or six-membered carbocyclic can be a five or six-membered saturated or unsaturated hetero-cyclic ring which can contain in any combination carbonyl or one or two oxygen or sulfur, and up to two R^2 and R^3 substituents attached to unsaturated ring carbon atoms wherein R^2 and R^3 individually can be halogen, nitro, cyano, or alkyl, polyhaloalkyl, alkoxy, polyhaloalkoxy, alkylthio, arylthio, alkylsulfinyl, arylsulfinyl, alkylsulfonyl, arylsulfonyl, alkylsulfamido, arylsulfamido, alkoxycarbonylamino, or alkylcarbonylamino of from 1 to 6 carbon atoms, or can contain up to two R^4 and R^5 substituents attached to saturated carbon atoms of the chain wherein R^4 and R^5 individually can be alkyl or polyhaloalkyl of from 1 to 6 carbon atoms; with the proviso that when B is a naphthyl group it is attached through an oxygen to the number 4 carbon atom of the phenyl group, and with the further proviso that (a) if X is halogen and is mono or disubstituted in the ortho position of a benzoyl ring (b) if Z and Z^1, are hydrogen (c) if no more than 2 of R, R^1, R^2 or R^3 are hydrogen, chloro or bromo, and (d) if Y represents chloro, then n has a value of at least 2.

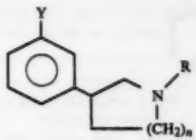
66. A method of controlling insects and acarides which comprises subjecting said insects to a lethal amount of the composition of claim 1.

4,426,386
SUBSTITUTED PHENYL PIPERIDINES

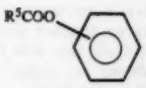
Folke L. Arvidsson, Uppsala; Per A. E. Carlsson, Göteborg; Ulf A. Hacksell, Uppsala; John S. M. Hjorth, Göteborg; Per. L. Lindberg, Askim; John L. G. Nilsson, Tullinge; Domingo Sanchez, Floda; Nils U. E. Svensson, Brunna, and Hakan V. Wikström, Göteborg, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Filed Dec. 5, 1980, Ser. No. 213,633
Claims priority, application Sweden, Dec. 5, 1979, 7910026
Int. Cl.³ C07D 211/34, 211/22, 211/32; A61K 31/445
U.S. Cl. 424—267 19 Claims

1. A compound characterized by the formula



wherein n is 1 or 2, Y is OH, R^1COO—, R^2R^3NCOO— or R^4O whereby R^1 is an alkyl group having 1–5 carbon atoms, a phenyl, 2,6-dimethylphenyl or 3- or 4-hydroxyphenyl group or a 3- or 4-alkanoyloxyphenyl group with the formula



wherein R^5 is an alkyl group having 1–6 carbon atoms, R^2 is an alkyl group having 1–5 carbon atoms, a phenethyl, benzyl or phenyl group, R^3 is an H or an alkyl group having 1–5 carbon atoms, and R^4 is an allyl or benzyl group, and R is an alkyl group having 1–5 carbon atoms, a hydroxyalkyl, dimethylaminoalkyl or methylthioalkyl group having 2–6 carbon atoms in the alkyl part and having the heteroatom bound in a position other than the 1 position, an alkenyl group having 3–5 carbon atoms other than a 1-alkenyl group, as the base or a pharmaceutically acceptable acid addition salt thereof.

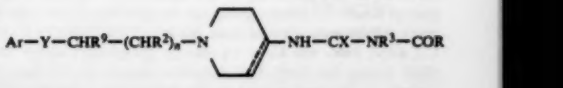
10. A method of treatment of disorders in the central nervous system associated with a pathological increase in central dopamine transmission comprising administering to a host in need of treatment of a therapeutically effective amount of a compound according to claims 1 or 2.

4,426,387
PIPERID-4-YL UREAS AND THIO UREAS USED AS ANTI-DEPRESSANT AGENTS

John L. Archibald, Windsor, and Terrence J. Ward, Slough, both of England, assignors to John Wyeth & Brother Ltd., Maidenhead, England

Continuation of Ser. No. 238,381, Feb. 25, 1981, abandoned. This application Apr. 7, 1982, Ser. No. 366,266
Claims priority, application United Kingdom, Mar. 1, 1980, 8007048; Aug. 22, 1980, 8027435
Int. Cl.³ A61K 31/445; C07D 211/56
U.S. Cl. 424—267 25 Claims

1. A compound of the formula



wherein

n is 0 or 1;

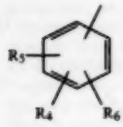
R^2, R^3, and R^9 are, independently, hydrogen or a lower alkyl group;

X is =O, or =S;

Y is —O— or a direct bond;

R is phenyl or phenyl substituted by one or two of the same substituents selected from loweralkyl, lower alkenyl, lower alkoxy, hydroxy, hydroxyloweralkyl, fluoro, bromo, chloro, chlorooweralkyl, fluorooweralkyl, amino, aminooweralkyl, substituted amino, loweralkoxycarboxyl, nitro, cyano, or amido;

Ar is



in which

R_4,R_5, and R_6, when present, independently, are hydrogen, lower alkyl, lower alkenyl, lower alkoxy, hydroxy, hydroxyloweralkyl, fluoro, bromo, chloro, chlorooweralkyl, fluorooweralkyl, amino, aminooweralkyl, substituted amino, loweralkoxycarbonyl, nitro, cyano, or amide, or

R_4 and R_5, when adjacent, together with the carbon atoms to which they are attached also are fused five or six member carbocyclic ring with 0-2 double bonds and optionally carrying one or two substituents as defined above for said R_4 and R_5, or

an acid addition or quaternary ammonium salt thereof, in which the dotted line represents an optional double bond.

4,426,388

5-BENZOTHIAZOLESULFONAMIDE DERIVATIVES FOR THE TOPICAL TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

Otto W. Woltersdorf, Jr., Chalfont, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

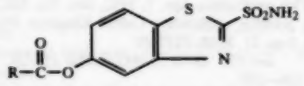
Filed Apr. 2, 1982, Ser. No. 364,953

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.³ C07D 277/80; A61K 31/425

U.S. Cl. 424—270 **14 Claims**

1. A compound of the formula



where R is C_1 to C_{18} alkyl; C_3 to C_6 cycloalky; C_3 to C_6 cycloalkyl C_1 to C_{18} alkyl; C_1 to C_{18} alkyl C_3 to C_6 cycloalkyl; phenyl where the phenyl group can be substituted with one or more substituents selected from the group consisting of C_1 to C_{10} alkyl, halo, and C_1 to C_4 alkoxy; phenylalkyl where the alkyl moiety has from 1 to 4 carbon atoms and the phenyl moiety can be unsubstituted or substituted with halogen or C_1 to C_3alkyl; C_2 to C_{18} hydroxyalkyl; C_2 to C_{18} amino alkyl; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl and aryl C_2 to C_6alkenyl.

4,426,389

DERIVATIVES OF CLAVULANIC ACID, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Irene Stirling, Reigate, and Brian P. Clarke, Kingswood, both of England, assignors to Beecham Group Limited, England

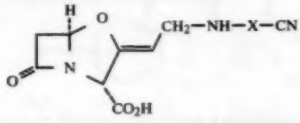
Filed Sep. 22, 1980, Ser. No. 189,624

Claims priority, application United Kingdom, Sep. 27, 1979, 7933448

Int. Cl.³ C07D 498/04; A61K 31/42

U.S. Cl. 424—272 **73 Claims**

1. A compound of the formula (II):



(II)

a pharmaceutically acceptable salt thereof, a pharmaceutically acceptable ester thereof wherein the ester moiety is of the formula

wherein A_1 is alkyl of 1 to 6 carbon atoms unsubstituted or monosubstituted by alkoxy of 1 to 7 carbon atoms or alkanoyloxy of 1 to 7 carbon atoms, tetrahydropyranyl or tetraydrofuranyl, or A_1 is a moiety of the sub-formula (a):

$$CHA_2A_3 \quad (a)$$

wherein A_2 is alkenyl of up to 5 carbon atoms, alkynyl of up to 5 carbon atoms, or phenyl unsubstituted or substituted by a fluorine, chlorine or bromine atom or by a nitro, alkyl of up to 4 carbon atoms or alkoxyl of up to 4 carbon atoms moiety; and A_3 is hydrogen, alkyl of up to 4 carbon atoms or phenyl unsubstituted or substituted by a fluorine, chlorine or bromine atom or by a nitro, alkyl of up to 4 carbon atoms or alkoxyl of up to 4 carbon atoms moiety; or A_1 is of the formula (b), (c) or (d):

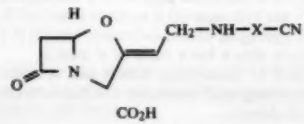
$$—CH_2—OA_5 \quad (b)$$

$$—CH_2—COA_5 \quad (c)$$

$$—CHA_4—OCOA_5 \quad (d)$$

wherein A_4 is hydrogen or methyl, A_5 is phenyl or benzyl, either of which is unsubstituted or substituted by 1 or 2 alkyl or alkoxyl moieties of up to 3 carbon atoms or either of which is substituted by a fluorine, chlorine or bromine atom or a nitro moiety; or A_4 and A_5 together with the —CH—O—CO moiety form a phthalidyl moiety which is unsubstituted or substituted by one or two alkyl or alkoxyl moieties of up to 3 carbon atoms, or by a fluorine, chlorine or bromine atom or a nitro moiety; or A_1 is ethoxycarbonyloxymethyl, methoxycarbonyloxyethyl or ethoxycarbonyloxyethyl, or a pharmaceutically acceptable acid addition salt of such an ester wherein X is alkylene of 1 to 6 carbon atoms, cycloalkylene of 3 to 8 carbon atoms or cycloalkyl alkylene of 3 to 8 carbon atoms in the cycloalkyl moiety and 1 to 4 carbon atoms in the alkylene moiety.

18. A pharmaceutical composition useful for treating bacterial infections in mammals including humans, which comprises an antibacterially effective amount of a compound of the formula (II):



(II)

a pharmaceutically acceptable salt thereof, a pharmaceutically acceptable ester thereof wherein the ester moiety is of the formula

$$CO_2A_1$$

wherein A_1 is alkyl of 1 to 6 carbon atoms unsubstituted or monosubstituted by alkoxy of 1 to 7 carbon atoms or alkanoyloxy of 1 to 7 carbon atoms, tetrahydropyranyl or tetrahydrofuranyl, or A_1 is a moiety of the sub-formula (a):

$$CHA_2A_3 \quad (a)$$

wherein A_2 is alkenyl of up to 5 carbon atoms, alkynyl of up to 5 carbon atoms, or phenyl unsubstituted or substituted by a fluorine, chlorine or bromine atom or by a nitro, alkyl of up to 4 carbon atoms or alkoxyl of up to 4 carbon atoms moiety; and A_3 is hydrogen, alkyl of up to 4 carbon atoms or phenyl unsubstituted or substituted by a fluorine, chlorine or bromine atom or by a nitro, alkyl of up to 4 carbon atoms or alkoxyl of up to 4 carbon atoms moiety; or A_1 is of the formula (b), (c) or (d):

$$-CH_2-OA_5 \quad (b)$$

$$-CH_2-COA_5 \quad (c)$$

$$-CHA_4-OCOA_5 \quad (d)$$

wherein A_4 is hydrogen or methyl, A_5 is phenyl or benzyl, either of which is unsubstituted or substituted by 1 or 2 alkyl or alkoxyl moieties of up to 3 carbon atoms or either of which is substituted by a fluorine, chlorine or bromine atom or a nitro moiety; or A_4 and A_5 together with the —CH—O—CO moiety form a phthalidyl moiety which is unsubstituted or substituted by one or two alkyl or alkoxyl moieties of up to 3 carbon atoms, or by a fluorine, chlorine or bromine atom or a nitro moiety; or A_1 is ethoxycarbonyloxymethyl, methoxycarbonyloxyethyl or ethoxycarbonyloxyethyl, or a pharmaceutically acceptable acid addition salt of such an ester wherein X is alkylene of 1 to 6 carbon atoms, cycloalkylene of 3 to 8 carbon atoms or cycloalkyl alkylene of 3 to 8 carbon atoms in the cycloalkyl moiety and 1 to 4 carbon atoms in the alkylene moiety, in combination with a pharmaceutically acceptable carrier.

4,426,390

NOVEL β-LACTAM COMPOUNDS, PROCESS FOR PRODUCING THEREOF, AND USE THEREOF AS MEDICINES

Mitsuyasu Okabe, Fujisawa; Takeo Yoshioka, Ayase; Yasuo Fukagawa, Kamakura; Rokuro Okamoto, Fujisawa; Kageaki Kouno, Tokyo, and Tomoyuki Ishikura, Chigasaki, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

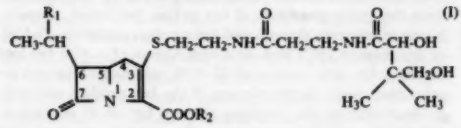
Filed Sep. 29, 1981, Ser. No. 306,931

Claims priority, application Japan, Oct. 1, 1980, 55-135829; Oct. 17, 1980, 55-144507; Dec. 5, 1980, 55-170864

Int. Cl.³ C07D *487/04;* A61K *31/40*

U.S. Cl. 424—274 **7 Claims**

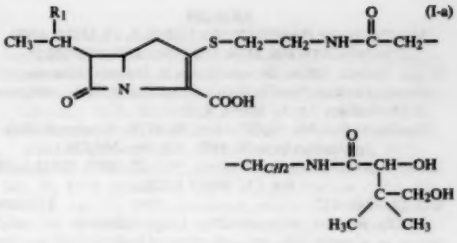
1. A compound of the formula



(I)

wherein R_1 represents a hydrogen atom, —OH or $-OSO_3H$, and R_2 represents a hydrogen atom, benzyl or benzyl substituted by 1 to 3 substituents selected from lower alkyl, lower alkoxy, halogen and nitro; or a pharmaceutically acceptable salt thereof.

7. An antimicrobial composition which comprises an antimicrobially effective amount of a compound of the formula



(I-a)

wherein R_1 represents a hydrogen atom, —OH, or $-OSO_3H$, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier or diluent.

4,426,391

[(ALKOXYCARBONYL)OXY]ALKYL ESTERS OF METHYLDOPA

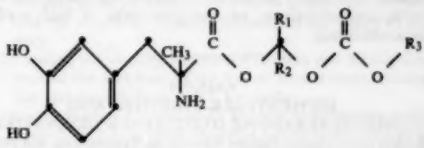
Jose Alexander, and Chung Shih, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 15, 1982, Ser. No. 418,326

Int. Cl.³ C07C *101/77;* A61K *31/265*

U.S. Cl. 424—301 **5 Claims**

5. An antihypertensive pharmaceutical composition comprising an effective amount of a compound of the formula:



wherein

R_1 and R_2 are independently hydrogen or alkyl having up to 10 carbon atoms;

R_3 is alkyl having from 1 to 10 carbon atoms

or a non-toxic pharmaceutically acceptable acid addition salt thereof.

4,426,392

CHEMICAL COMPOUNDS

Alexander C. Goudie, Harlow, England, assignor to Beecham Group Limited, England

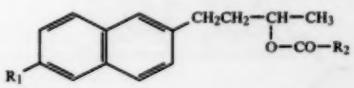
Division of Ser. No. 55,613, Jul. 9, 1979, Pat. No. 4,299,844, which is a continuation of Ser. No. 792,724, May 2, 1977, abandoned. This application Jul. 27, 1981, Ser. No. 287,260

Claims priority, application United Kingdom, May 13, 1976, 19653/76; Oct. 1, 1976, 40937/76

Int. Cl.³ A61K *31/235*

U.S. Cl. 424—308 **9 Claims**

1. A method of treating inflammation in humans and animals which comprises orally or parenterally administering to a human or animal in need thereof an anti-inflammatory amount of a compound of the formula (III):



wherein R_1 is chloro or methoxy and R_2 is methyl, ethyl, benzyl, 2-methoxyethyl, phenyl, 4-methoxyphenyl or aminomethyl, in combination with a pharmaceutically acceptable carrier.

4,426,393

METHOD OF PROTECTING USEFUL PLANTS AND FORMULATIONS FOR USE IN SAID METHOD

Nicola Troiani, Milan; Franco Gozzo, S. Donato Milanese, and Simone Lorusso, San Giuliano Milanese, all of Italy, assignors to Montedison S.p.A., Milan, Italy

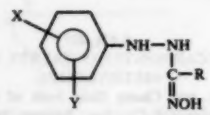
Division of Ser. No. 98,027, Nov. 28, 1979, abandoned. This application Sep. 29, 1981, Ser. No. 306,730

Claims priority, application Italy, Nov. 29, 1978, 30322 A/78

Int. Cl.³ A01N *33/26*

U.S. Cl. 424—327 7 Claims

1. The method of combatting fungi infections of useful plants, or of preventing such infections, which method consists of applying to the plants a fungicidally effective amount of arylhydrazo-aldoximes having the formula:



in which

X and Y are H, halogen, C_1–C_5 alkyls, $-CF_3$, $-OCH_3$ or NO_2; and

R is H, C_1–C_5 alkyl, phenyl or phenyl substituted with 1 or 2 halogen atoms;

tautomers of said arylhydrazo-aldoximes, organic salts of said arylhydrazo-aldoximes, or inorganic salts of said arylhydrazoaldoximes.

4,426,394

DIPHENYLALKANOETHER AND DIPHENYLALKANONE OXIMEETHER DERIVATIVES

Keiichi Ono, Osaka; Hajime Kawakami, Takarazuka, and Junki Katsube, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

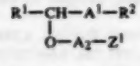
Division of Ser. No. 136,565, Apr. 2, 1980, Pat. No. 4,388,469. This application Oct. 30, 1981, Ser. No. 316,972

Claims priority, application Japan, Apr. 2, 1979, 54-40032; Aug. 13, 1979, 54-103340

Int. Cl.³ A61K *31/34, 31/38, 31/135*

U.S. Cl. 424—330 12 Claims

1. A pharmaceutical composition comprising an effective cerebral vasodilating amount of at least one compound of the formula:



wherein

R^1 and R^2 are each independently a phenyl, thienyl, furyl or naphthyl group optionally substituted with 1 to 3 substituents selected from the group consisting of halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, cyano, di(C_1–C_4)alkylamino, amino, benzyloxy, hydroxyl, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, C_1–C_4 alkanoylamino, C_1–C_4 alkylamino and N-(C_1–C_4)alkyl-N-(C_1–C_4)alkanoylamino,

Z^1 is a group of the formula:

wherein

R^3 and R^4 are each independently a hydrogen atom, a C_1–C_4 alkyl group or an ar(C_1–C_4)alkyl group,

A^1 is a C_3–C_6 alkylene group and

A^2 is a C_2–C_4 alkylene group, or a non-toxic, pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable diluent or carrier.

4,426,395

RETORT SALAD AND ITS PRODUCTION PROCESS

Muneo Sakai; Gyota Taguchi; Kiwako Tsuji, and Takashi Sakita, all of Yokohama, Japan, assignors to The Nisshin Oil Mills, Ltd., Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 361,156

Claims priority, application Japan, Mar. 23, 1981, 56-40381

Int. Cl.³ A23L *1/24*

U.S. Cl. 426—46 6 Claims

1. A process for producing a retort salad having improved emulsification heat stability, comprising:

reacting protease with an aqueous dispersion of an alcohol-denatured soybean protein so as to cause partial hydrolysis;

concentrating or drying the protein;

preparing a mayonnaise-like food using the resulting soybean protein thus partially hydrolyzed as an emulsifier;

mixing the mayonnaise-like food with raw salad materials;

packing the mixture into a heat and pressure resistant container;

deairing and sealing the container; and then

heat-sterilizing the container at an elevated temperature.

4,426,396

PRESERVATION OF HARVESTED CROPS AND ANIMAL FEEDSTUFFS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jun. 11, 1981, Ser. No. 272,687

Int. Cl.³ A23K *3/00*

U.S. Cl. 426—53 18 Claims

1. The method for preserving harvested crops and animal feedstuffs which comprises applying, in the presence of urease, a preservative composition comprising ammonia and urea in a fluid medium to said crops in an amount effective to prevent the growth of pathogenic microorganisms.

4,426,397

PROCESS FOR THE PRODUCTION OF A CONCENTRATE CONTAINING A BEE PRODUCT, A CONCENTRATE CONTAINING A BEE PRODUCT AND ITS USE

Rudolf Schanze, b. G. Herrmann-Seidel, Friedenstr. 43, D-8034 Unterpfaffenhofen, Fed. Rep. of Germany

Filed Dec. 11, 1981, Ser. No. 329,692

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1980, 3049380

Int. Cl.³ A23L *1/08, 1/30*; A23C *9/10*

U.S. Cl. 426—62 13 Claims

1. A process for the production of a dry, stable bee product composition which comprises adding a bee product selected from the group consisting of bee pollen, bee bread, propolis, honey or mixtures thereof, said bee product containing 0–10% of dry mass of bee's wax, to a concentrate of a milk product having a dry mass content of 25–50%, adding a carbohydrate other than sugar to the mixture of the bee product and milk product, stirring the resulting mixture for 10–60 minutes at 15°–75° C. until a homogeneous dispersion is obtained, and drying the homogeneous dispersion, the amounts of the individual constituents being such that the total dry mass of the dry, stable, bee product composition contains from 10 to 40% by weight dry mass emanating from said bee product, 25–70% by weight dry mass emanating from said milk product, and from 3–55% by weight dry mass emanating from said carbohydrate.

4,426,398

FOOD PRODUCT HAVING A MAIN COMPONENT COMPRISING POWDER MADE FROM SOFT SHELL TURTLES AND THE METHOD OF MANUFACTURE THEREFOR

Tsunehiko Kokura, Minooshi, and Mitsuyori Inoue, Yokohama-shi, both of Japan, assignors to Iwatani Sangyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1981, Ser. No. 296,533
Claims priority, application Japan, Dec. 25, 1980, 55-186598
Int. Cl.³ A22C *29/00*; A23J *1/04*; A23L *1/325*
U.S. Cl. 426—72 20 Claims

1. A method of manufacturing powder from soft shell turtles, comprising:

freezing clean, living soft shell turtles by immersing said soft shell turtles in liquid nitrogen;

coarsely crushing the frozen soft shell turtles; and

grinding the crushed soft shell turtles into a powder in an atmosphere of nitrogen gas at a temperature at least as low as −50 degrees centigrade.

4,426,399

PREPARATION OF A DEHYDRATED PORK RIND PRODUCT

Clive R. Whittle, Claverley; Mark T. Whittle, Bridgnorth, and Timothy J. M. Treharne, East Grinstead, all of England, assignors to Protein Foods (U.K.) Limited, England

Filed Dec. 16, 1981, Ser. No. 331,297
Claims priority, application United Kingdom, Jan. 2, 1981, 8100005
Int. Cl.³ A23L *1/27, 1/31*
U.S. Cl. 426—265 11 Claims

1. A process for the preparation of a dehydrated pork rind product containing haemoglobin which comprises rehydrating a gelatin-stable dehydrated pork rind product, for at least a portion of the rehydration time, in a haemoglobin-containing solution, and then dehydrating the haemoglobin-containing rehydrated product obtained, whereby a product having a water content of less than 15% by weight and a haemoglobin content of up to 50% by weight is obtained.

4,426,400

DEVILED EGG PROCESS

James L. Newlin, Rochester, and William J. Stadelman, West Lafayette, both of Ind., assignors to Tip-E-Pak, Inc., Rochester and Purdue Research Foundation, West Lafayette, both of, Ind.

Continuation of Ser. No. 326,013, Nov. 30, 1981, abandoned. This application Jul. 11, 1983, Ser. No. 512,597
Int. Cl.³ A23L *1/32*
U.S. Cl. 426—282 7 Claims

1. A method for the production of deviled eggs, which comprises labor-sparing and materials-sparing steps of pooling, blending, and de-aerating liquid egg whites, separately pooling and blending liquid egg yolks, providing a multiplicity of open molds carried on a conveyor means and dispensing the de-aerated egg whites into said multiplicity of open molds carried on conveyor means, the said molds having the shape and size of half an egg, introducing medially into each of said open molds a removable insert spaced from the sides of the open mold so as to maintain the mold in an open condition, the removable insert forming a hemispherical cavity the size of half a yolk in the egg white pool in each mold, conveying said filled open molds containing said inserts into a cooking zone and maintaining them in said zone for sufficient time to cook the egg whites, conveying them out of the cooking zone, removing the inserts, separately cooking and seasoning the egg yolks, and filling the cooked egg white halves with said seasoned egg yolk to produce deviled eggs.

4,426,401

FOOD PROCESS

Alexander B. Ottow, Rotterdam-Schiebroek; Arthur Stiegeler, Dietmannsride, and Jan Tjaden, Durach, all of Fed. Rep. of Germany, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Continuation of Ser. No. 153,239, May 27, 1980, abandoned, which is a continuation of Ser. No. 55,843, Jul. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 945,768, Sep. 25, 1978, abandoned, which is a continuation of Ser. No. 787,656, Apr. 14, 1977, abandoned, which is a continuation of Ser. No. 676,562, Apr. 13, 1976, abandoned. This application Dec. 16, 1981, Ser. No. 331,387
Claims priority, application Luxembourg, Apr. 14, 1975, 72277
Int. Cl.³ A21D *8/06*; A23L *3/10*; B65B *29/08*
U.S. Cl. 426—394 1 Claim

1. A process for the preparation of baked or part-baked goods of improved shelf-life, the process comprising in combination the sequential steps of:

(a) packing dough pieces in a package constucted essentially from flexible film and comprising a tray furnished with flat edges of 2 to 5 mm in width extending about the periphery of the tray and a lid adapted to overlay the said tray and abut the said flat edges;

(b) providing non-tortuous straight vents between the lid and tray by placing two or more spacers each comprising flat non-tortuous straight strips about 1 mm thick with a cross sectional area less than 2.5 mm^2 laid flat between the abutting surfaces of the tray and lid to separate the tray and lid at spaced intervals around the periphery of the tray;

(c) sealing the abutting surfaces of the tray and lid together around the periphery of the tray to form a seam between the said spacers from 2 to 5 mm wide;

(d) withdrawing the spacers to provide interruptions in the seam constituting vents providing access to the interior of the package of at least 2.5 mm^2 total cross-sectional area and 2 to 5 mm in length, said vents permitting the package to be heated to baking temperatures without rupture and to be cooled without collapse;

(e) placing the package in a baking oven and exposing it to heat for a period of 40 to 60 minutes at 100° to 140° C.; and then

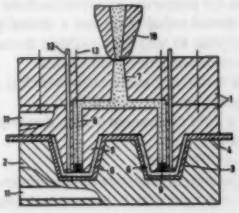
(f) cooling the package and sealing said vents.

4,426,402

METHOD FOR RAPIDLY PRODUCING CHOCOLATE FORMS

Güenther Kaupert, Thueringer Str. 1/5927 Erndtebrueck, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 138,152, Apr. 7, 1980, abandoned. This application Aug. 11, 1982, Ser. No. 407,057
Int. Cl.³ A23G *1/21*; A23P *1/00*
U.S. Cl. 426—515 4 Claims



1. A method for rapidly producing well-defined chocolate forms in a molding tool consisting of at least lower and upper parts which together define a molding cavity having limited minor surface areas and major surface areas corresponding to a well-defined shape of a chocolate form to be molded therein

and further having an inlet opening through which heated chocolte is injected under pressure into said molding cavity until the cavity is completely filled, said method comprising the steps of: inserting into the molding tool before it is closed a retaining and handling element which fits between the upper and lower parts of the molding tool and defines said limited minor areas to be contacted by the chocolate in the cavity; injecting molten chocolate under pressure into said molding cavity and into contact with said major mold surface areas and with the minor surface area formed by said retaining and handling element; cooling the upper molding part having said major surface areas to about −5° C. and the lower mold part receiving said retaining and handling element to about 20° C. during and after the injection step; lifting the upper part of the molding tool while holding the chocolate form in the lower part of the molding tool and lifting and removing from the lower part of the molding tool the retaining and handling element with the chocolate form supported thereon; and further cooling the chocolate form while supported on the retaining and handling element.

4,426,403

FLAVORING WITH ETHYL-2-METHYLTHIOISOBUTYRATE

Matthew J. Cyronak, Hightstown, N.J.; Paul R. Zanno, Hopewell Junction, and Robert J. Soukup, New City, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,857

Int. Cl.³ A23L *1/226*

U.S. Cl. 426—535 **3 Claims**

1. A foodstuff comprising an amount of ethyl-2-methylthioisobutyrate of from about 0.004 to about 20 parts per million of the foodstuff on an as-consumed basis, said amount being effective to enhance or augment a green pine needle flavor in the foodstuff.

4,426,404

PREPARATION OF AN INTERMEDIATE LAYER BETWEEN A HIGH-MELTING DENTAL METAL ALLOY AND DENTAL PORCELAIN

Itzhak Shoher, and Aaron Whiteman, both of Tel Aviv, Israel, assignors to Etablissement Dentair Ivoclar, Schaan, Liechtenstein

Filed Nov. 25, 1981, Ser. No. 324,901

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046334

Int. Cl.³ A61C *13/00*

U.S. Cl. 427—2 **11 Claims**

1. A process for preparing and intermediate layer between a high-melting dental metal alloy and a dental porcelain which comprises applying to said high-melting dental metal alloy, a composition comprising the components:

(a) at least a metal or a metal alloy which is thermally stable at a temperature of at least 800° C.;

(b) gold or a gold compound which decomposes to metallic gold, or a gold alloy;

(c) at least one flux; and

(d) aluminum and/or silver or an aluminum—silver alloy or a silver compound which decomposes two metallic silver, in a liquid vehicle (A) in which component (c) is at least partially soluble, drying the so-treated high-melting dental metal alloy and sintering said composition and thereafter treating the so-sintered composition with a liquid (B) in which the non-metallic components of said composition are at least partially soluble.

4,426,405

METHOD FOR PRODUCING IMPROVED SILICON CARBIDE RESISTANCE ELEMENTS

Frank J. Hierholzer, Jr., Florissant, and Gerald L. Shelton, St. Louis, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 20, 1981, Ser. No. 236,377

Int. Cl.³ C23C *13/04, 11/00*

U.S. Cl. 427—50 **9 Claims**

1. The process of forming a silicon carbide resistance element by chemical vapor deposition comprising forming a porous, partially bonded granular silicon carbide shape of precisely controlled electrical resistance; placing said shape in a furnace; heating said shape to a temperature of between 1000° and 1400° C.; exposing said heated shape to a gas containing a reducing agent, carbon, silicon and between about 0.01 and 3.0%, by weight of the gas, nitrogen to penetrate the shape and produce a dense coating of silicon carbide containing co-deposited nitrogen.

4,426,406

METHOD OF FABRICATING A PRESSURE SENSOR

Mark A. Brooks, 8320 Canal Rd., Sterling Heights, Mich. 48087 and Jane Miler, 5177 Somerton, Troy, Mich. 48098

Division of Ser. No. 233,370, Feb. 11, 1981, Pat. No. 4,340,409, which is a continuation of Ser. No. 30,588, Apr. 16, 1979, abandoned. This application Dec. 28, 1981, Ser. No. 335,003

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—58 **5 Claims**

1. A method of fabricating a quartz plate of a pressure capsule comprising the steps of:

12.1 printing on a suitable surface of the quartz plate an electrically conductive metal-organic ink forming at least one electrode thereon;

12.2 drying said ink in atmospheric conditions at a determinable temperature;

12.3 gradually increasing the temperature of the quartz plate to free the organic binders in the metal-organic ink;

12.4 increasing the temperature of the quartz plate to a level at which the remaining metal will bond to the surface of the quartz plate;

12.5 printing on said surface a non-conductive dielectric material, including a glass frit material having organic binders, of determinable shape and thickness;

12.6 heating the quartz plate at atmospheric conditions to dry the dielectric material; and

12.7 preglazing the quartz plate by raising its temperature in an oxygen enriched environment to change the dielectric material to a glass state and free binders in the dielectric material.

4,426,407

PROCESS FOR PRODUCING THIN-FILM TRANSISTORS ON AN INSULATING SUBSTRATE

Francois Morin, Le Carpont Lanmerin, 22300 Lannion; Jean-Luc Favennec, 16, Cite du Vallon, Saint Quay Perros 22700 Perros Guirec, and Madeleine Bonnel, 58, Residence du Roux, 22300 Lannion, all of France

Filed Dec. 20, 1982, Ser. No. 451,413
Claims priority, application France, Dec. 23, 1981, 81 24118
Int. Cl.³ B05D 5/12, 3/06; C23F 1/02; B44C 1/22
U.S. Cl. 427—86 11 Claims

1. A process for the production of thin-film transistors on an insulating substrate, wherein it comprises the following stages:

deposition on an insulating substrate of a coating of a metal able to form a silicide in contact with a silicon;

photoengraving of the metal coating to define the sources, drains and channels for the transistors and various connections between the transistors;

deposition of a silicon coating by reactive gaseous phase plasma, a silicide coating forming on the surface of the metal of the photoengraved coating;

deposition of a silica coating by reactive gaseous phase plasma;

deposition of a conductive coating by reactive gaseous phase plasma, and

photoengraving of the conductive coating - silica coating - silicon coating system, without etching the silicide coating covering the photoengraved metal coating.

2. A process according to claim 1, wherein it also comprises the operations of post-hydrogenating a system in a hydrogen plasma and passivating the system with a reactive gaseous phase plasma-deposited silica coating.

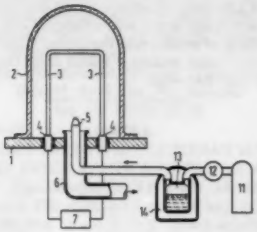
4,426,408

METHOD OF DEPOSITION OF SILICON IN FINE CRYSTALLINE FORM

Wolfgang Dietze, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,463
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831816
Int. Cl.³ C30B 23/06
U.S. Cl. 427—95 9 Claims

1. Method for deposition of silicon in fine crystalline form upon a substrate from a silicon-containing gas which comprises, at a set mole ratio of the reaction gas and throughput selected for the deposition process, setting the deposition rate-determining temperature of the substrate, at the beginning of the deposition, at a temperature at least equal to optimal temperature for deposition of silicon thereon and, in accordance with consequent increase in thickness of the silicon deposited on the substrate, gradually reducing the deposition beginning temperature of the substrate throughout the deposition process



to a minimal value near the end of the deposition process while maintaining the other parameters determining the rate of deposition.

4,426,409

CATIONIC POLYMERS FOR USE IN FREEZE PROTECTION OF COALS AND MINERALS

William J. Roe, Aurora, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 2, 1982, Ser. No. 394,969
Int. Cl.³ B05D 7/00
U.S. Cl. 427—221 8 Claims

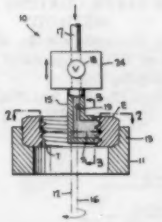
1. A method for treating particulate particles having surface moisture to reduce the cohesive strength of such particulate particles when frozen which comprises spraying the particulate particles prior to freezing with an effective amount of a dilute aqueous solution which contains about 1-10% by weight of a water-soluble cationic polymer, which solution also contains a freezing point depressant amount of an anti-freeze chemical.

4,426,410

METHOD FOR COATING INTERNAL THREADS OF A FASTENER

Colin Watson, Stillorgan, Ireland, and David J. Dunn, Twinsburg, Ohio, assignors to Loctite Corporation, Newington, Conn.

Division of Ser. No. 243,517, Mar. 13, 1981, Pat. No. 4,372,245.
This application Nov. 3, 1982, Ser. No. 438,988
Int. Cl.³ B05D 1/26, 7/22
U.S. Cl. 427—232 4 Claims



1. A process for applying a sealant to the threads of a female threaded element, comprising:

holding the element on a rotatable base for rotation therewith;

providing a sealant applicator having a discharge orifice opening through a smooth side wall thereof;

positioning said applicator with the central axis thereof parallel to and offset from the rotational axis of said base,

and with said side wall in contact engagement with the crests of the threads;

rotating said base about said rotational axis; and

discharging the sealant through said orifice;

whereby a side force directed toward said orifice is induced during rotational about said rotational axis for facilitating the pressing of sealant into the thread roots of the element while any excess sealant is wiped from the threads by an edge of said side wall.

4,426,411

METHOD OF FABRICATING A STEEL PRESSURE ROLL FOR USE IN A PRESSURE-FIXATION APPARATUS

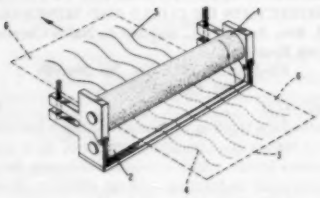
Yoshitaka Sasaki, 100-1, Ohaza-higashibeppu, Kumagaya-shi, Saitama-ken, and Keitaro Yamashita, 579, Ohaza-Jimbohara-cho, Kamisato-machi, Kodama-gun, Saitama-ken, both of Japan

Division of Ser. No. 23,001, Mar. 22, 1979, abandoned. This application Dec. 11, 1980, Ser. No. 215,413

Claims priority, application Japan, Mar. 23, 1978, 53-37370

Int. Cl.³ B05D *3/04, 3/12;* **C25D** *5/44, 7/04*

U.S. Cl. 427—349 **2 Claims**



1. A method of treating the surface of a steel pressure roll for use in pressure-fixation apparatus of electrophotographic duplicating apparatus for reducing glare of the pressure-fixed image comprising the steps of:

a. hardening the surface of the steel pressure roll;

b. hard chrome-plating the hardened surface;

c. first shot-blasting the chrome-plated surface with sharp-edged hard particles, said first-shot blasting step for providing a surface substantially covered with sharp-edged recesses; and

d. second shot-blasting the first shot-blasted surface with steel balls, said second shot-blasting step for rounding the sharp edges of the recesses.

4,426,412

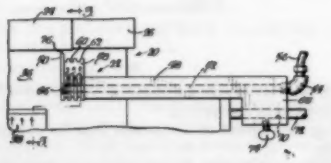
EDGE DAM FOR PAPER COATING APPARATUS AND METHOD

Kenneth W. Gebert, Wisconsin Rapids, and Pat A. Rajski, Stevens Point, both of Wis., assignors to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Filed Sep. 13, 1982, Ser. No. 416,966

Int. Cl.³ B05C *3/18*

U.S. Cl. 427—356 **11 Claims**



1. An improved edge dam assembly for an applicator for applying coating liquid to a moving web of paper carried through an application zone, wherein the applicator is of the type having a body defining a chamber therein with an elongate opening to the chamber positionable generally adjacent to and transversely across the web, the chamber receiving coating liquid and directing the same through the opening into the application zone and onto the web, said edge dam assembly comprising a mechanical seal element at a side end of the opening and zone generally opposite from and extending closely adjacent to but in spaced gap relationship with the web slightly inwardly of a side edge of the web for sealing the side end of the application zone against any significant flow of coating liquid therepast; a body portion on a side of said seal element outwardly of the application zone, said body portion having a surface toward the web edge the entirety of which is spaced therefrom by an amount greater than the gap of the seal element from the web to define an enlarged space between said surface and the web edge, said space having an open outer end; and means for directing a flow of flushing liquid through said body portion surface and against the side edge of the web opposite therefrom to flush the side edge of the web free of any coating liquid which seeps past said seal element and onto the web edge, said seal element providing the seal at the application zone side end and said flushing liquid serving solely to flush from the web edge any coating liquid seeping past said seal element gap from the side edge of the web.

4,426,413

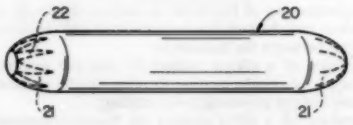
HEAT-RECOVERABLE CLOSURE ASSEMBLY

Vernon A. Fentress, Foster City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 155,817, Jun. 2, 1980, abandoned. This application May 7, 1982, Ser. No. 376,073

Int. Cl.³ H02G *13/06;* **H01R** *3/00*

U.S. Cl. 428—36 **11 Claims**



1. A heat-recoverable closure assembly comprising a heat-recoverable outer sleeve surrounding a body to be enclosed thereby, a support member surrounding the body and within the sleeve which support member has slotted end portions arranged to be capable of forming a tapering transition from the support member to the body, and a flexible thermal barrier layer comprising a flexible foam sheet associated with at least the slotted portions of the support member and bridging the slots thereof; said barrier layer being sufficiently flexible so as not to hinder the tapering of the slotted end portions.

4,426,414

LAMINATED NON-WOVEN FABRIC

Forrest W. Wilkerson, Ashville, N.C., assignor to Beacon Manufacturing Company, Swannanoa, N.C.

Filed Sep. 8, 1982, Ser. No. 416,032

Int. Cl.³ B32B *3/06*

U.S. Cl. 428—102 **18 Claims**

1. A laminated non-woven fabric having particular utility as a bedding blanket, comprised by:

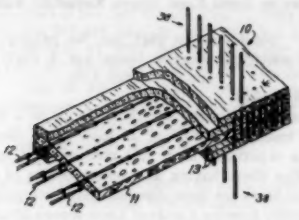
a core of flexible cellular sheet material;

spaced rows of reinforcing elements incorporated into the core and dimensionally stabilizing the core against stretching in a first direction;

first and second facings on opposite sides of said core, one of said facings being of fibrous sheet material;

the fibers of said fibrous sheet material facing being partially

embedded within the other facing sheet at the opposite side of the core;



the fibers of said one said fibrous sheet material facing being oriented in a direction transverse to said rows of reinforcing elements, and dimensionally stabilizing the fabric in a direction transverse to said first direction.

4,426,415

TUFTED CARPETING, ESPECIALLY ARTIFICIAL TURF, WITH TUFTS STITCHED THROUGH MULTIPLE LAYERS OF PRE-WOVEN BACKING MATERIAL OF DIFFERING GAUGE

George S. Avery, Rome, Ga., assignor to V&L Manufacturing Company, Inc., Rome, Ga.

Filed Dec. 11, 1981, Ser. No. 329,828
Int. Cl.³ B32B *7/08, 7/10*
U.S. Cl. 428—17 **8 Claims**

1. A tufted carpet for use as artificial turf, comprising:

a first layer of woven synthetic plastic primary backing material having a first, smaller number of picks per inch on the order of 11 picks per inch so that it is of a coarser weave;

a second layer of woven synthetic plastic primary backing material having a second, larger number of picks per inch on the order of 20 picks per inch so that it is of a finer weave;

a pile of yarn or threads, of synthetic plastic material simulating grass, tufted through both of said layers of primary backing material so as to have a face protruding from the finer weave second layer of woven primary backing material;

the number of picks per inch of the second layer of woven primary backing material being no integer multiple of the number of picks per inch of the first layer of woven primary backing material;

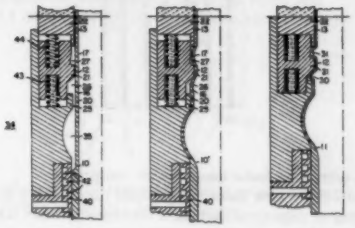
means bonding the tufted pile to the second layer of woven primary backing material, said bonding means being constituted by an adhesive bonding agent which has been applied in liquid form by a coater while the coarser weave first layer of primary backing material faces the coater, and the bonding agent has penetrated to but not substantially through the finer weave second layer of primary backing material.

4,426,416

ARTICLE OF PLASTIC MATERIAL HAVING A NECK PORTION INCLUDING ANNULAR PROTUBERANCES WITH MONOAXIALLY ORIENTED MATERIAL

Kjell M. Jakobsen, Skanor; Claes T. Nilsson, Loddekopinge, and Lars G. Larsson, Hoor, all of Sweden, assignors to PLM Aktiebolag, Malmo, Sweden

Division of Ser. No. 196,374, Oct. 14, 1980. This application Feb. 15, 1983, Ser. No. 466,650
Int. Cl.³ B65D *23/00*
U.S. Cl. 428—36 **9 Claims**



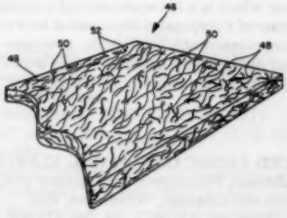
1. An article of thermoplastic material adapted for being molded in a container, said article comprising a tubular neck portion including annular protuberances of hollow ring-shaped profile, and a tubular shoulder portion continuing from said neck portion, said neck portion having a wall the material of which is substantially monoaxially oriented and wherein annular protuberances are circumferentially expanded from said wall without axial strain of the monoaxially oriented material of said wall whereby the material in said neck portion is of substantially uniform thickness and monoaxially oriented therethroughout including said annular protuberances.

4,426,417

NONWOVEN WIPER

Gary H. Meitner, Winneconne, Wis., and Harry W. Hotchkiss, Marietta, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 28, 1983, Ser. No. 479,417
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—195 **12 Claims**



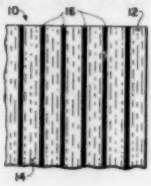
1. An improved nonwoven wiper comprising a matrix of fibers having a total basis weight in the range of from about 25 to 300 grams per square meter including a web of thermoplastic microfibers having an average diameter in the range of up to about 10 microns and having distributed throughout said web a mixture of synthetic staple fibers and cotton fibers, said mixture being present in an amount up to 90% by weight based on the total matrix weight and containing up to 90% synthetic staple fibers based on the total weight of the mixture.

4,426,418

LUBRICATED TISSUE

Michael G. Coleman, Tempe, and Israel A. Lesk, Scottsdale, both of Ariz., assignors to Harry M. Weiss, Phoenix, Ariz.

Continuation of Ser. No. 591,558, Jun. 30, 1975, abandoned.
This application Jul. 20, 1981, Ser. No. 285,418
Int. Cl.³ A61M 35/00; B32B 3/10, 29/06; C11D 17/06
U.S. Cl. 428—211 4 Claims



1. A lubricated facial tissue which comprises:

a facial tissue type sheet of absorbent paper, and a grouped array of regions of said sheet impregnated with lubricant means for applying lubricating material onto a person's skin, each of the regions being at least substantially surrounded by absorbent paper free of lubricating material, said grouped array has a major and a minor dimension and said sheet has a grain, the major dimension of said grouped array lying substantially along the grain, said grouped array of regions being exposed and extending horizontally and vertically across a surface portion of said sheet.

4,426,419

PRESSURE SENSITIVE ADHESIVES BASED ON ASPHALT FLUX

William E. Uffner, Newark, and Robert N. White, Etna, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 12, 1982, Ser. No. 407,395
Int. Cl.³ C08L 95/00
U.S. Cl. 428—290 4 Claims

1. A thermally-insensitive, pressure-sensitive adhesive having good adhesion to cementitious substrates consisting essentially of the reaction product of asphalt flux having a softening point of about 38° C. to about 44° C., a penetration of about 155 to about 200, a viscosity at 200° F. of about 380 cps to about 440 cps and a viscosity at 325° F. of about 50 cps to about 85 cps, a polymerizable vinyl aromatic monomer, a non-depolymerized rubber which is a homopolymer of a conjugated diene or a copolymer of a conjugated diene and at least one ethylenic monomer copolymerizable therewith, a terpene resin, and unvulcanized rubber which has been treated with a depolymerizing agent to decrease its molecular weight.

4,426,420

SPUNLACED FABRIC CONTAINING ELASTIC FIBERS

Kewal K. Likhyani, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 17, 1982, Ser. No. 419,399
Int. Cl.³ D04H 5/00
U.S. Cl. 428—224 8 Claims

1. In a process for making a spunlaced nonwoven fabric, wherein a batt composed of at least two types of staple fibers is subjected to hydraulic entanglement, the improvement comprising, for imparting greater stretch and resilience to the fabric, forming the batt of hard fibers and potentially elastic, elastomeric fibers and after the hydraulic entanglement treatment, heat-treating the resultant spunlaced fabric to develop elastic characteristics in the elastomeric fibers.

4,426,421

MULTILAYER COMPOSITE SHEET USEFUL AS A SUBSTRATE FOR ARTIFICIAL LEATHER

Kenji Nakamae, and Tsukasa Shima, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 29, 1982, Ser. No. 362,935
Claims priority, application Japan, Apr. 3, 1981, 56-49285
Int. Cl.³ D06N 3/00
U.S. Cl. 428—234 5 Claims

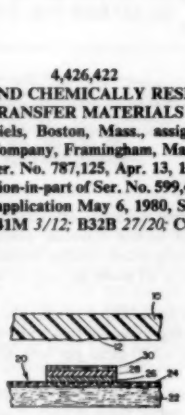
1. A multilayer composite sheet useful as a substrate for artificial leather, comprising at least three fibrous layers, namely, a superficial layer (A) consisting of spun-laid extremely fine fibers having an average denier of 0.5 or less, which fine fibers are three dimensionally entangled with each other, thereby forming a body of a non-woven fibrous layer; an intermediate layer (B) consisting of synthetic staple fibers having a length of 50 mm or less, which staple fibers are entangled with each other to form a body of a non-woven layer; and a base layer (C) consisting of a woven or knitted fabric, said superficial layer (A), said intermediate layer (B) and said base layer (C) being superimposed together in the above-mentioned order and being subjected to needle-punching or water-stream-ejecting under high pressure thereby to form a composite sheet wherein a portion of the fibers in each non-woven fibrous layer penetrates into the inside of the adjacent layers and said penetrated fibers become entangled with the fibers in the adjacent layers.

4,426,422

DISTORTION AND CHEMICALLY RESISTANT HEAT TRANSFER MATERIALS

George R. E. Daniels, Boston, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 787,125, Apr. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 599,431, Jul. 28, 1975, abandoned. This application May 6, 1980, Ser. No. 146,999
Int. Cl.³ B41M 3/12; B32B 27/20; C09J 7/02
U.S. Cl. 428—352 5 Claims



1. A heat transfer label laminate for applying a label to a product substrate comprising a layer of heat activatable adhesive,

a print layer adjacent the adhesive layer comprising a polymeric layer in the form of a print pattern, and a protective layer adjacent the print layer wherein

the protective layer comprises a mixture of at least two polymeric components, one of which is a reinforcement and the other of which is a matrix, the reinforcement component comprising a rosin ester or an ethylene vinyl acetate copolymer and the matrix comprising a polyester of a glycol and phenolindane carboxylic acid or a copolyester of isophthalic acid and teraphthalic acid.

4,426,423

CERAMIC, CERMET OR METAL COMPOSITES

Josef Intrater, Englewood Cliffs, N.J., and Gene Bertoldo, New York, N.Y., assignors to Advanced Technology Inc., Palisades Park, N.J.

Continuation-in-part of Ser. No. 315,452, Oct. 27, 1981, Pat. No. 4,376,806, Ser. No. 268,015, May 28, 1981, Pat. No. 4,374,903, Ser. No. 242,716, Mar. 11, 1981, Pat. No. 4,396,677, and Ser. No. 200,514, Oct. 24, 1980, Pat. No. 4,358,506. This application Sep. 10, 1982, Ser. No. 415,502

The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.

Int. Cl.³ B32B *15/04;* B05D *5/12*

U.S. Cl. 428—408 29 Claims

1. A composite of tin, lead, indium, a tin alloy, a lead alloy or an indium alloy, as a component, in combination with a carbide or carbonyl former, as an adherent coating, film or layer on a base or substrate of nitride, oxide, arsenide, aluminum gallium arsenide, titanate, silicide, boride, telluride, phosphide, carbide or oxides of metals, metalloids, or compacted forms thereof, which is non-dewettable upon heating and of a zero to negative angle of contact between the adherent coating and said base or substrate and a substantially void free interface between said coating, film, or layer and said base or substrate.

4,426,424

HEAT-SENSITIVE RECORDING MATERIALS

Naoto Arai, Ikeda; Takuji Tuji, Sakai, and Hiroshi Yoneda, Amagasaki, all of Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,858

Claims priority, application Japan, May 23, 1981, 56-78231

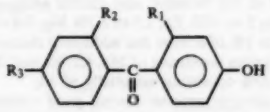
Int. Cl.³ B32B *9/04*

U.S. Cl. 428—411 7 Claims

1. A heat-sensitive recording material, comprising:

a support;

a heat-sensitive recording layer positioned on the support, wherein the heat-sensitive recording layer comprises a colorless or pale-colored basic dye and a color developing material that, when heated, reacts with the basic dye to form a color, the color developing material being comprised of a compound having the general formula (I):

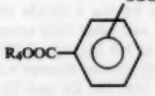


(I)

wherein R_1, R_2 and R_3 independently represent hydrogen or a hydroxyl group; and

a heat-fusible material selected from the group consisting of:

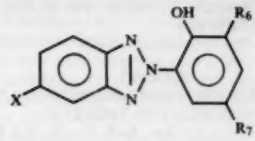
(a) a compound having the general formula (II):



(II)

wherein the substituents are positioned at the ortho- or para- position; and R_4 and R_5 independently represent an alkyl group having 1 to 6 carbon atoms, a phenyl group or a cyclohexyl group;

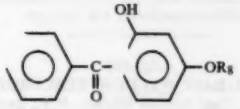
(b) a compound having the general formula (III):



(III)

wherein R_6 and R^7 independently represent hydrogen or an alkyl group having 1 to 8 carbon atoms; and X represents hydrogen or a halogen atom; and

(c) a compound having the general formula (IV):



(IV)

wherein R_8 represents an alkyl group having 1 to 12 carbon atoms or a benzyl group.

4,426,425

NOVEL POLYAMINE COMPOUNDS AND THEIR USE AS CURING AGENTS FOR EPOXY RESINS

Raymond H. Good, Barrington, Ill., and Paul McBride, Aughton, England, assignors to Eastman Kodak Company, Rochester, N.Y.

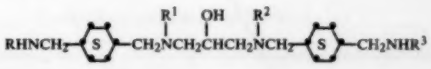
Division of Ser. No. 301,919, Sep. 14, 1981. This application Mar. 24, 1983, Ser. No. 478,585

Claims priority, application United Kingdom, Jun. 18, 1981, 8118448

Int. Cl.³ C08G *59/50*

U.S. Cl. 428—414 3 Claims

1. A method of curing an epoxy resin wherein there is used as curing agent a compound having the structure



wherein R, R^1, R^2 and R^3 are each independently selected from hydrogen and straight or branched chain alkyl groups of 1 to 10 carbons, and such groups substituted with 1–3 of the same or different groups selected from alkoxy of 1–10 carbons, phenyl, cyclohexyl and hydroxyl.

4,426,426

WELDING ALLOY AND METHOD

Horst Mühlberger, Staufenstrasse 29, D-6000 Frankfurt/Main 1, Fed. Rep. of Germany

Filed Jul. 22, 1982, Ser. No. 400,671

Int. Cl.³ C22C *37/10;* B22D *19/00;* B32B *15/00;* B23K *9/00*

U.S. Cl. 428—682 7 Claims

1. A welding member in a form for generating a weldment welding to a spheroidal graphite cast iron body, said member consisting by weight of an alloy of the following composition:

less than 0.1% manganese,

less than 1.0% carbon,

2.8 to 2.9% silicon,

0.6 to 0.8% copper,

0.1 to 0.25% molybdenum,

0.2 to 0.3% aluminum

1 to 3% nickel,

up to 1% tungsten,

up to 0.1% chromium,

up to 0.1% vanadium, magnesium and/or rare earth ele-

ments in an amount up to and sufficient to promote the formation of graphite spherulites upon cooling, and balance substantially iron.

4,426,427

SATURATED PREFORM AND METHOD FOR PREPARATION THEREOF

Wolf R. Vieth, 19 Partridge Run, Belle Meade, N.J. 08502, and Leonard B. Ryder, 5 Sharon Dr., Whippany, N.J. 07981

Division of Ser. No. 399,824, Jul. 19, 1982. This application Jun. 20, 1983, Ser. No. 505,886

Int. Cl.³ B32B 9/04

U.S. Cl. 428—542.8 6 Claims

1. Presaturated plastic preform saturated with a dissolved presaturant gas selected from the group consisting of carbon dioxide, dichlorodifluoromethane, and oxygen.

4,426,428

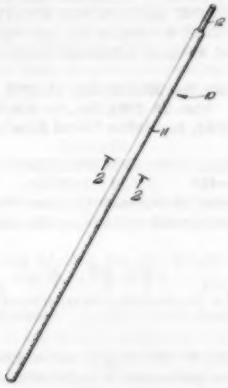
NICKEL-BASE WELDING ELECTRODE

Paul A. Kammer, Cold Springs Harbor, N.Y., and Edward R. Gamberg, Saverna Park, Md., assignors to Eutectic Corporation, Flushing, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,479

Int. Cl.³ B22F 7/04; B23K 35/32

U.S. Cl. 428—561 6 Claims



1. A nickel-base welding electrode consisting essentially of a nickel core and a metallic powder-laden flux coating bonded thereto,

the total composition of said electrode comprising about 40% to 50% by weight of said nickel core and about 60% to 50% by weight of said coating,

said coating containing as fluxes about 18% to 30% titanium dioxide, about 8% to 16% calcium fluoride, about 1% to 3% iron carbonate, about 1.5% to 4% calcium carbonate, about 2% to 6% calcium-magnesium carbonate, and containing as the powdered metals about 20% to 30% chromium, about 3% to 8% manganese, about 1% to 4% molybdenum, about 1% to 5% niobium, about 8% to 18% iron, 0% to about 6% nickel, up to 1% graphite, and as extrusion aids about 1% to 4% clay and about 1% to 5% organic extrusion aid material,

the flux in said coating being mixed with a bonding agent at the ratio of dry flux to bonding agent of about 5:1 to 10:1, the composition of the bonding agent being about 2% to 10% potassium carbonate, about 40% to 70% potassium silicate, about 1% to 6% potassium hydroxide, about 20% to 35% sodium silicate and 0 to about 15% water,

the composition relationship of the metal powder in the flux to the nickel core being such as to provide a weld deposit produced by an electro-arc process, taking into account metal losses due to oxidation, containing less than about 0.25% C, about 10% to 20% chromium, about 5% to 12% iron, about 0.5% to 2.5% niobium, up to about 1% silicon, about 2% to 5% manganese, up to about 5% molybdenum and the balance essentially nickel,

the deposit rate of said weld deposit using the electro-arc process being substantially greater than the deposit rate for the same weld deposit produced from an electrode having a nickel alloy core of substantially the same composition of the weld deposit instead of a nickel core.

4,426,429

ALUMINIUM ALLOYS COMPOSITE PLATES

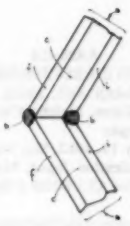
Ettore Di Russo; Massimo Buratti, and Silvano Veronelli, all of Novara, Italy, assignors to Alluminio Italia S.p.A., Portoscuso, Italy

Filed Dec. 8, 1981, Ser. No. 328,655

Claims priority, application Italy, Apr. 15, 1981, 21206 A/81

Int. Cl.³ B32B 15/20

U.S. Cl. 428—654 4 Claims



1. A composite plate formed of solution heat treated, quenched and aged aluminum alloys, selected from the group consisting of Al-Zn-Mg and Al-Zn-Mg-Cu, having a thickness between 10 and 100 mm and suited to be used as an armor plate, which comprises:

(a) a central alloy component possessing high hardness and mechanical strength and having a tensile strength ranging from 540 to 735 N/mm², said central alloy component comprising 5 to 10% Zn, 1.5 to 3.5% Mg, 0.8 to 2.5% Cu and 0.25 to 1% of at least one additional element selected from the group consisting of Mn, Cr, Zr and Ti, the balance to 100% consisting essentially of Al;

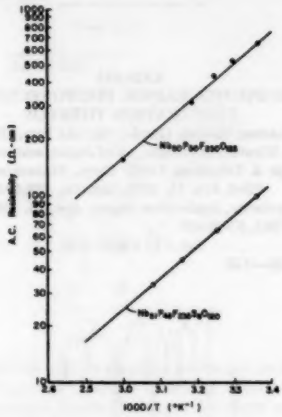
(b) a front alloy component having good weldability and toughness properties and having a tensile strength between 345 and 540 N/mm², said front alloy component comprising 4 to 7% Zn, 1 to 3% Mg, 0 to 0.5% Cu, and 0.25 to 1% of at least one additional element selected from the group consisting of Mn, Cr, Zr and Ti, the balance to 100% consisting essentially of Al; and

(c) an inner alloy component having good weldability and toughness properties having a tensile strength between 290 and 520 N/mm², said inner alloy component comprising 3 to 7% Zn, 0.5 to 3% Mg, 0 to 0.5% Cu and 0.25 to 1% of at least one additional element selected from the group consisting of Mn, Cr, Zr and Ti, the balance to 100% consisting essentially of Al, said front alloy component, and inner alloy components reciprocally contacting said central alloy component in a superimposed position and welded together on their respective surfaces said central alloy component being 35 to 62% of the total composite thickness.

4,426,430
INORGANIC $NBF_5(TAF_5)$-P_2O_5 ELECTROLYTES

Paul A. Tick, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 12, 1982, Ser. No. 441,119
Int. Cl.³ H01M 4/36
U.S. Cl. 429—103 4 Claims

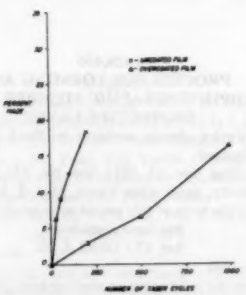


1. A composition consisting essentially, in weight percent, of about 65–95% of a pentavalent metal fluoride selected from the group consisting of NbF_5 and TaF_5, 5–25% P_2O_5, at least 85% total of $NbF_5+TaF_5+P_2O_5$ and, as optional constituents, up to about 15% total of one or more halogens selected from the group consisting of Cl, Br and I, up to about 2% total of the group consisting of Li and B, and up to about 3% S.

4,426,431
RADIATION-CURABLE COMPOSITIONS FOR RESTORATIVE AND/OR PROTECTIVE TREATMENT OF PHOTOGRAPHIC ELEMENTS

Louis P. Harasta, Rochester; Gerald M. Leszyk, Spencerport, and Edward D. Morrison, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 22, 1982, Ser. No. 421,694
Int. Cl.³ G03C 1/78, 1/76, 1/68; C08F 2/46
U.S. Cl. 430—14 45 Claims



23. A photographic element comprising:
(1) a support,
(2) at least one image-bearing layer,
and
(3) a protective overcoat layer which is permanently bonded to at least one side of said element, said protective overcoat layer having been formed by (a) coating said element with a radiation-curable coating composition which forms a transparent, flexible, scratch-resistant, crosslinked polymeric layer upon radiation curing, said coating composition comprising: (1) a polymerizable epoxy compound, (2) a cationic initiator for initiating polymerization of said epoxy compound, (3) a polymerizable acrylic compound, (4) a free-radical initiator for initiating polymerization of said acrylic compound, said free-radical initiator comprising a haloalkylated aromatic ketone, and (5) a polymerizable organofunctional silane, and (b) subjecting said coating to radiation sufficient to cure said coating and bond it to said element.

4,426,432
ELECTROPHOTOSENSITIVE RECEPTOR WITH TRISAZO COMPOUND

Kiyoshi Sawada; Satoshi Goto; Osamu Sasaki; Jiro Takahashi, and Tawara Komamura, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

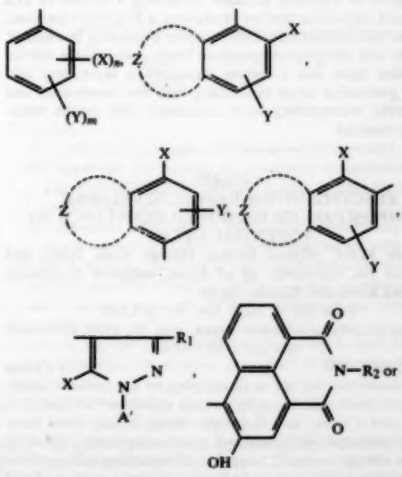
Filed Apr. 26, 1982, Ser. No. 372,228
Claims priority, application Japan, May 7, 1981, 56-69176
Int. Cl.³ G03G 5/06
U.S. Cl. 430—58 15 Claims

1. An electrophotosensitive receptor comprising a conductive support and an electrophotosensitive layer thereon comprising a carrier transporting material and an azo compound selected from the formula

$$A—N=N—Ar_1—N=N—Ar_2—N=N—A$$

wherein Ar_1 and Ar_2 are individually selected from a divalent aromatic ring; and wherein

A is selected from



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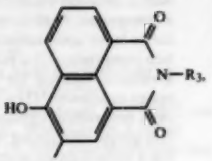


wherein X is selected from a hydroxy group,

or —$NHSO_2$—R_6 wherein R_4 and R_5 are individually selected from a hydrogen atom or an alkyl group, R_6 is selected from an alkyl group and an aryl group; Y is selected from a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, a carboxy group, a sulfo group, a carbamoyl group and a sulfamoyl group; Z is selected from at least one atomic group necessary for forming an aromatic ring; A' is selected from an aryl group; R_1 is selected from a hydrogen atom, an amino group, an alkyl group, a carbamoyl group, or a carboxy group and ester thereof; R_2 and R_3 are individually selected from an alkyl group, an aralkyl group and an aryl group; m is 0, 1 or 2; and n is 1 or 2, wherein each of the following groups:

R_4 and R_5-an alkyl group;

R_6-an alkyl group and an aryl group;

Y-an alkyl group, an alkoxy group, a carboxy group, a sulfo group, a carbamoyl group, and a sulfamoyl group;

Z-an aromatic ring;

A'-an aryl group;

R_1-an amino group, an alkyl group, a carbamoyl group, and a carboxy group;

R_2 and R_3-an alkyl group, an aralkyl group, and an aryl group;

may be substituted with at least one substituent selected from the group consisting of a halogen atom, a cyano group, a hydroxy group, an amino group, a nitro group, a carboxy group, an alkyl group, an aryl group, an alkoxy group, a acylamino group, a carbamoyl group, a sulfonamido group, and a sulfamoyl group, said azo compound being applied as a coating solution containing a solvent or as a liquid dispersion mixture containing a dispersion medium.

2. The electrophotosensitive receptor according to claim 1, wherein said electrophotosensitive layer comprises a carrier generation layer and a carrier transporting layer, and said carrier generation layer containing said azo compound, and said carrier transporting layer containing said carrier transporting material.

4,426,433

ELECTROPHOTOGRAPHIC DEVELOPER COMPOSITION OF IMPROVED RESISTANCE TO POTENTIAL DECAY

Toshitaro Kohri, Higashi Osaka; Hitoshi Kato, Itami, and Noboru Ito, Kawanishi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Jul. 6, 1981, Ser. No. 281,205

Claims priority, application Japan, Aug. 23, 1980, 55-116146

Int. Cl.³ G03C 9/10

U.S. Cl. 430—109 **4 Claims**

1. A developer for use in developing an electrostatic latent image by electrophotography, which developer comprises a carrier and a toner, said developer being of improved resistance to potential decay and said toner comprising a coloring agent, a charge controller capable of imparting tribopositive chargeability to the toner and a binder, at least a portion of said binder being a thermoplastic resin having a functional group consisting essentially of a Lewis acid functional group, and said resin being tribonegatively chargeable, the charge controller being present in an amount sufficient to impart tribopositive chargeability to the toner.

4,426,434

ELECTROPHOTOGRAPHIC PHOTORECEPTOR AND PREPARATION THEREOF

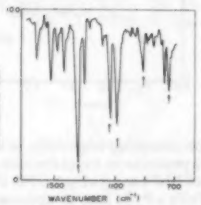
Koichi Arishima; Takeshi Okada; Akiyuki Tate, all of Mito, and Hiroaki Hiratsuka, Tomobe, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Musashino, Japan

Filed Jun. 14, 1982, Ser. No. 388,192

Claims priority, application Japan, Jun. 23, 1981, 56-96040; Mar. 15, 1982, 57-39484

Int. Cl.³ G03G 5/06

U.S. Cl. 430—128 **7 Claims**



1. A method of preparation of an electrophotographic photoreceptor for use in laser printing machines comprising:

evaporating over an electrically conductive substrate under vacuum from about 10 to about 10^{-4} Pa on a film selected from the group consisting of chloroaluminium phthalocyanine, and chloroaluminium monochlorophthalocyanine:

treating said film with an organic solvent constituting a good solvent for said film; and

overcoating said treated film with a layer of charge transport material.

4,426,435

PROCESS FOR FORMING AN ELECTROPHOTOGRAPHIC MEMBER HAVING A PROTECTIVE LAYER

Kozo Oka, Toyko, Japan, assignor to Rank Xerox Limited, London, England

Filed Nov. 19, 1981, Ser. No. 322,792

Claims priority, application Japan, Mar. 2, 1981, 56-13779

The portion of the term of this patent subsequent to May 3, 2000, has been disclaimed.

Int. Cl.³ G03G 8/00

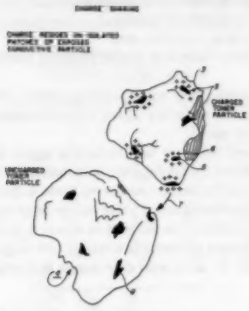
U.S. Cl. 430—132 **4 Claims**

1. A process for producing an electrophotographic light-sensitive member comprising providing a film comprising metal oxide particles having a mean particle size below about 0.3 micrometer dispersed in a resin, applying a layer of photoconductive material on said film, said film being substantially transparent in the wavelength region to which said layer of photoconductive material is sensitive, and applying a conductive layer to said layer of photoconductive material.

4,426,436
PROCESS FOR POSITIVE CHARGE SHARING TONER COMPOSITIONS

Richard B. Lewis, Williamson; Paul C. Julien, Webster; Robert J. Gruber, Pittsford, and Richard F. Koehler, Jr., Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1981, Ser. No. 296,609
Int. Cl.³ G03G 21/00
U.S. Cl. 430—137 9 Claims



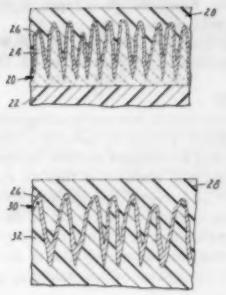
1. A process for rapidly charging uncharged toner particles to a positive polarity, which comprises adding uncharged toner particles to a positively charged developer composition comprising carrier particles and toner particles, the charged and uncharged toner particles containing conductive particles or conductive patches embedded in the surface thereof in an amount of from about 5 percent to about 15 percent thereby retaining the electrically insulating characteristics of the toner composition, which conductive patches are of a higher positive triboelectric charge than the toner polymer, contacting the charged toner particles with the uncharged toner particles causing positive charges to be transferred from the conductive particles on the charged toner particles, to conductive particles on the uncharged toner particles, within a period of from about 5 seconds to about 2 minutes, thereby resulting in substantially the same level of positive charge intensity for both the original charged toner particles and the added toner particles, such charge intensity ranging from about 5 microcoulombs per gram to about 50 microcoulombs per gram.

4,426,437
IMAGEABLE MATERIAL WITH RADIATION ABSORBING MICROSTRUCTURED LAYERS OVERCOATED WITH PHOTORESIST LAYER

Richard S. Fisch, St. Paul, and Valdis Mikelsons, Mendota Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 29, 1981, Ser. No. 278,978
Int. Cl.³ G03C 1/96, 1/94
U.S. Cl. 430—166 13 Claims

1. An imageable article comprising a photoresist layer coated on a substantially radiation absorbing layer of metal on a microstructured layer, both the metal layer and microstructured layer having a microstructured surface characterized by a plurality of randomly positioned discrete protuberances of varying heights and shapes, which protuberances have a height of not less than 20 nanometers nor more than 1500 nm, the average spacing between the tips of the protuberances being no more than twice the average height of the protuberances, and the bases of which contact the bases of substantially all adjacent protuberances wherein the metal is selected from chromium, aluminum, copper, gold and nickel.

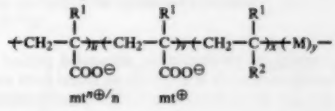


4,426,438
ANIONIC COPOLYMERS CONTAINING POLYVALENT METAL CATIONS AND THEIR USE IN PHOTOGRAPHIC MATERIALS

Günter Helling, Cologne, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 15, 1981, Ser. No. 225,382
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1980, 3002287
Int. Cl.³ G03C 1/40, 5/54
U.S. Cl. 430—213 3 Claims

1. A supported transparent layer consisting of a polymer dispersion of particles of a cross-linked anionic copolymer dispersed in a binder wherein said anionic copolymer has non-ionic cross-links, contains polyvalent metal ions and which corresponds to the following formula



in which

R^1 represents hydrogen, methyl or carboxymethyl,

R^2 represents the residue of an organic cross-linking compound having in the monomeric state at least two copolymerizable C—C double bonds,

M represents polymerized units of an ethylenically unsaturated monomer capable of copolymerisation with acrylic acid, methacrylic acid or (meth-)acrylic acid esters

$mt^{n\oplus}$ represents a metal cation of valency n, where $n \geqq 2$,

$mt^{\oplus}$ represents an alkali metal cation or an ammonium cation,

u,v,x,y represent the molar proportions in mol % of the polymerised monomers contained in the copolymer, as follows:

u: 20–99 mol %,

x: 0.5–10 mol %

the molar proportions represented by v and y may combine to equal a mol percent of from 0 to 79.5.

4,426,439

METHOD AND APPARATUS FOR PROCESSING NEGATIVE PHOTORESIST

Koichi Kobayashi, Yokohama; Kenichi Kawashima, Sagamihara, and Shuzo Oshio, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 11, 1981, Ser. No. 329,941
Claims priority, application Japan, Dec. 12, 1980, 55-175634
Int. Cl.³ G03C 5/04
U.S. Cl. 430—269 13 Claims

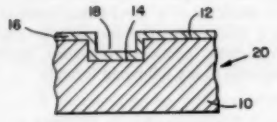
1. A method of exposure processing comprising the steps of: exposing for pattern writing in vacuum a film of negative photoresist emulsion to charged particle beams or soft X-ray beams, transferring said photoresist film to, and keeping the film in, a chamber of non-oxidizing gas atmosphere containing up to 5% volume oxygen for a period of time sufficient to inhibit postpolymerization or curing of the photoresist, and thereafter removing the photoresist film to the outside atmosphere from said atmosphere of non-oxidizing gas.

4,426,440

INTEGRATED OPTICAL GRATING DEVICE BY THERMAL SiO_2 GROWTH ON SI

David E. Thompson, Placentia, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 18, 1982, Ser. No. 442,700
Int. Cl.³ G03C 5/00
U.S. Cl. 430—321 5 Claims



1. A method of producing an integrated optical grating device having extremely low scattering losses from an optical grating pattern or other surface relief feature generated in a highly polished and prepared silicon wafer surface and replicated in a subsequently grown thermal layer of SiO_2, said method comprising:

(i) providing a silicon wafer having a highly polished surface and prepared for receiving a grating pattern or any other surface relief feature pattern on said silicon wafer surface for its predetermined use;

(ii) generating said grating pattern or other surface relief feature pattern on said highly polished silicon wafer surface by a holographic exposure-etching technique;

(iii) milling away a portion of the silicon wafer surface by reactive ion etching, chemical etching, or ion milling to produce said grating or other surface relief feature in accordance with said pattern generated on said highly polished silicon wafer surface; and,

(iv) growing a 4–8 micrometers thick growth layer of SiO_2 on said silicon wafer wherein said produced grating or other surface relief feature is replicated in said SiO_2 growth layer.

4,426,441

DYE-FORMING DEVELOPERS IN AN IMAGING MATERIAL AND PROCESS

Anthony Adin, and Roy C. DeSelms, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1982, Ser. No. 446,737
Int. Cl.³ G03C 5/24, 1/40
U.S. Cl. 430—351 58 Claims

9. In a photothermographic element comprising a support having thereon, in reactive association:

(a) photographic silver halide,

(b) a dye-forming coupler, and

(c) an oxidation-reduction image forming combination comprising

(1) an organic silver salt oxidizing agent, and

(2) an organic reducing agent for said organic silver salt oxidizing agent,

the improvement wherein said reducing agent is a ureidoaniline reducing agent that is capable in its oxidized form of reacting with said dye-forming coupler to form a dye.

40. A process of producing a dye image in an exposed photothermographic element as defined in claim 9 comprising heating said element to a temperature within the range of about 90° C. to about 200° C. until said dye image is produced.

4,426,442

METHOD OF PRODUCING METAL IMAGES OR PATTERNS ON AND/OR BELOW THE SURFACE OF A SUBSTRATE COMPRISING A SEMICONDUCTING LIGHT-SENSITIVE COMPOUND

Arian Molenaar, and Peter E. Wierenga, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1982, Ser. No. 441,580
Claims priority, application Netherlands, Dec. 15, 1981, 8105633
Int. Cl.³ G03C 5/04, 5/24
U.S. Cl. 430—413 8 Claims

1. A method of producing metal images or patterns on and/or below the surface of a substrate material wherein or whereon there is a semiconducting, light-sensitive compound or which consists of that compound, the semiconducting compound being capable after having been exposed to light to deposit from a metal ion solution this metal in the form of nuclei which are intensified by means of physical development or with the aid of an electroless plating solution, characterized in that the surface in which or on which the light-sensitive compound is provided is immersed in a solution containing ions of a nuclei forming metal and is exposed in accordance with a pattern by means of a focused beam of laser light which moves in a controlled manner relative to the substrate and has such a wavelength in the ultra-violet or visible portion of the spectrum that it is absorbed by the relevant semiconducting compound.

4,426,443

PREPARATION OF HYDROLYZED COLLAGEN-CONTAINING PRODUCTS FROM NON-GELLED, LIQUID HYDROLYZED COLLAGEN CONCENTRATE AND GELLED PRODUCTS PREPARED THEREFROM

Joseph L. Shank, Matteson, Ill., assignor to DynaGel, Incorporated, Calumet City, Ill.

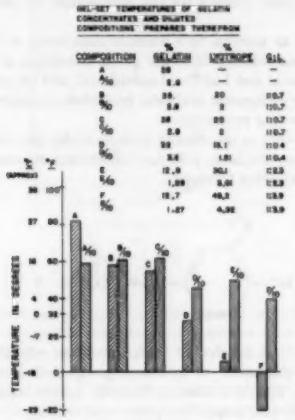
Filed Aug. 27, 1981, Ser. No. 295,796
Int. Cl.³ B05D 3/02, 7/00; C08L 89/06
U.S. Cl. 430—538 13 Claims

1. A method for coating a substrate with a hydrolyzed collagen gel comprising the steps of:

providing first volume of an aqueous hydrolyzed collagen concentrate comprising water, from about 10 to about 60 weight percent hydrolyzed collagen and a non-acid lyotropic agent, the weight ratio of hydrolyzed collagen-to-

non-acid lyotropic agent being about 1:0.1 to about 1:4.5, said concentrate having a gel-set temperature of less than about 20° C. and a pH value between about 2.5 and about 7;

diluting said first volume of hydrolyzed collagen concentrate to from about 2 to about 300 times said first volume to a hydrolyzed collagen concentration of between about 0.5 and about 25 weight percent to provide a diluted composition having a gel-set temperature higher than that of said hydrolyzed collagen concentrate;



applying said diluted composition, prior to gelation, to contact the surface of a substrate and form a coating thereon; and

maintaining said applied, diluted composition in contact with said substrate surface at a temperature below the gel-set temperature of said diluted composition for a time sufficient to form a gel on said surface.

2. The method according to claim 1 wherein said non-acid lyotropic agent includes calcium chloride.

4. The method according to claim 2 wherein said substrate is a photographic film precursor sheet and said method provides a subbing for photographic film.

4,426,444
HYDROQUINONE DERIVATIVES AND THEIR USE IN PHOTOGRAPHIC MATERIALS

Stephen R. Postle, Brentwood, and Patrick D. P. Thomas, Chelmsford, both of England, assignors to Ciba Geigy AG, Basel, Switzerland

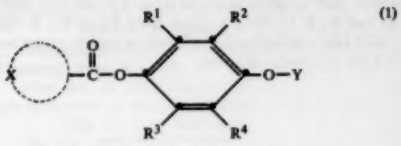
Division of Ser. No. 306,847, Sep. 29, 1981. This application Sep. 17, 1982, Ser. No. 419,337

Claims priority, application United Kingdom, Oct. 2, 1980, 8031835

Int. Cl.³ G03C *1/06*

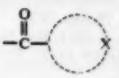
U.S. Cl. 430—566 5 Claims

1. Photographic silver halide material for activation processing after exposure which comprises on a support at least one colloid silver halide layer and at least one colloid layer which comprises at least one substituted hydroquinone compound of formula (1)



(1)

wherein R^1, R^2, R^3 and R^4 are each hydrogen or alkyl having from 1 to 4 carbon atoms, X represents the atoms necessary to complete a 2-, 3- or 4-pyridyl ring optionally quaternised with alkyl or aralkyl containing from 1 to 7 carbon atoms and Y is hydrogen or a group of the formula



wherein X is as defined above.

4,426,445
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Junji Minamizono; Mitusori Hirano; Yoshiro Kawashima, and Tadashi Ogawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film, Co., Ltd., Minami-ashigara, Japan

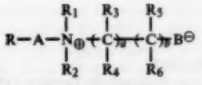
Continuation of Ser. No. 261,327, May 7, 1981, abandoned. This application Mar. 31, 1983, Ser. No. 479,119

Claims priority, application Japan, May 7, 1980, 55-60359

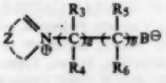
Int. Cl.³ G03C *1/28*

U.S. Cl. 430—599 25 Claims

1. A silver halide photographic light-sensitive material comprising a support having coated thereon at least one silver halide emulsion layer, said photographic light-sensitive material containing at least one compound selected from the group consisting of a compound represented by the following general formula (I) and a compound represented by the following general formula (II), wherein the surface tension of a 1% by weight aqueous solution of the compound represented by general formula (I) or (II) at a temperature of 20° C. is 45 dyne/cm or more, in at least one layer of the silver halide emulsion layer and other hydrophilic colloid layers thereof in a sufficient amount to sensitize the silver halide emulsion without being accompanied by an undesirable increase in the formation of fog:



General Formula (I)



General Formula (II)

wherein R represents an alkyl group having 1 to 6 carbon atoms which may be substituted, an aryl group having 6 to 11 carbon atoms which may be substituted, or an aralkyl group having 7 to 12 carbon atoms which may be substitute; A represents a s bond or a divalent connecting group which links R and the nitrogen atom; R_1 and R_2 are independently an alkyl group having 1 to 6 carbon atoms which may be substituted, or an aralkyl group having 7 to 11 carbon atoms which may be substituted, or where A represents a s bond, one of R_1 and R_2 may represent an atomic group necessary to form a heterocyclic ring containing the quaternary nitrogen atom together with R; a and b each represents 0 or a positive integer, provided that a and be are not both 0; R_3, R_4, R_5 and R_6 each

represents hydrogen or an alkyl having 1 to 6 carbon atoms which may be substituted and when b is not 0, at least one of R_5 and R_6 is a different group from R_3 or R_4; B represents —COO or —SO_3; and Z represents an atomic group necessary to form a heterocyclic ring.

4,425,446

LEUCOCYTE ADHERENCE INHIBITION ASSAY FOR DETECTION OF CANCER

David M. P. Thomson, Monte Royal, Canada, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 3, 1981, Ser. No. 231,063
Int. Cl.³ G01N *33/52, 33/54, 33/88*
U.S. Cl. 435—7 12 Claims

1. In a tube leucocyte adherence inhibition assay for the detection of cancer in a subject wherein samples of a known amount of peripheral blood leucocyte are incubated horizontally with either specific or nonspecific tumor antigen extracts in test tubes, the test tubes are carefully placed vertically and the non-adherent cells are counted for each sample and the non-adherent index determined, the improvement which comprises:

(a) preincubating said peripheral blood leucocytes with an effective concentration of an agent which maximizes cAMP levels in leucocytes to thereby heighten the LAI response of such leucocytes; and

(b) treating said adherent or non-adherent cells with a vital cell dye selected from the group consisting of methylene blue, nonspecific esterase and neutral red, separating said adherent or non-adherent cells, extracting said dye, determining the optical adsorption of said extracted solution which is directly proportional to the number of cells present thus providing the number of adhering or non-adhering cells without the necessity of optically counting such cell directly wherein said agent which maximizes cAMP levels in the leucocytes is a prostaglandin compound which stimulates leucocyte cAMP or a phosphodiesterase inhibitor which prevents cAMP destruction.

4,426,447

HOMOCITRIC ACID OLIGORIBOSIDE DERIVATIVE FOR PREVENTION OF DENTAL CARIES

Yoshiro Okami, Tokyo; Kazuhiko Yamada, Fujisawa, and Masachika Takashio, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Division of Ser. No. 281,800, Jul. 9, 1981, which is a continuation-in-part of Ser. No. 238,324, Feb. 26, 1981, abandoned. This application May 7, 1982, Ser. No. 375,924
Claims priority, application Japan, Mar. 8, 1980, 55-29690
Int. Cl.³ C12P *19/44*; C12N *9/99, 1/20*; C12R *1/465*
U.S. Cl. 435—74 3 Claims

1. A process for the production of ribocitrin or a nontoxic salt thereof which comprises cultivating the ribocitrin-producing strain Streptomyces sp. MF980-CF1 (FERM-P5430; ATCC 31820) or a ribocitrin-producing mutant thereof under submerged aerobic conditions in an aqueous nutrient medium until a substantial amount of ribocitrin is produced by said organism in said culture medium and recovering the ribocitrin or nontoxic salt thereof from the medium.

4,426,448

NOVEL HYDROXY-CINNAMIC ACID ESTER HYDROLASE AND PROCESS FOR PRODUCING SAME

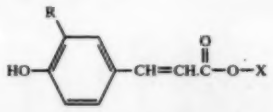
Shigemichi Okamura, Noda, and Masazumi Watanabe, Kashiwa, both of Japan, assignors to Kikkoman Corporation, Noda, Japan

Division of Ser. No. 325,182, Nov. 27, 1981, Pat. No. 4,370,416. This application Nov. 10, 1982, Ser. No. 440,453
Claims priority, application Japan, Dec. 8, 1980, 55-172118
Int. Cl.³ C12P *7/42*; C12G *1/00*; A23L *1/20*
U.S. Cl. 435—146 2 Claims

1. An enzymic process for the production of caffeic acid comprising:

(a) adding an enzyme to a material containing at least one compound selected from the group consisting of caffeoyl tartaric acid and 3-caffeoyl quinic acid, said enzyme being a hydroxy-cinnamic acid ester hydrolase characterized by the following properties:

(i) the ability to specifically hydrolyze the ester linkage of hydroxy-cinnamic acid ester substances represented by the following formula:



wherein R is selected from the group consisting of a hydrogen atom, a hydroxyl group and a methoxyl group, and X is selected from the group consisting of tartaric acid residue or quinic acid residue;

(ii) the lack of substantial tannic acid-decomposing activity;

(iii) an optimum pH for said hydrolase activity of about 6.5, and a stable pH range of from about 3 to about 7.5;

(iv) a loss of said hydrolase activity when heat-treated at 70° C. for 10 minutes and a maintenance of about 80% of said hydrolase activity when heat-treated at 60° C. for 10 minutes;

(v) inhibition by Hg^{++}, Fe^{++}, 8-hydroxyquinoline, iodine or diisopropylfluorophosphoric acid;

(vi) a molecular weight of about 150,000 as measured at 4° C. in a 0.1 M citrate buffer solution having a pH value of about 5.0; and

(vii) an acidic protein with an isoelectric point of about PI 4.8, and

(b) hydrolyzing the ester linkage of said compound with said enzyme to produce caffeic acid.

4,426,449

METHOD FOR PRODUCING VICINAL DIHALOGENATED PRODUCTS

John Geigert, Clayton, and Saul L. Neidleman, Oakland, both of Calif., assignors to Cetus Corporation, Berkeley, Calif.

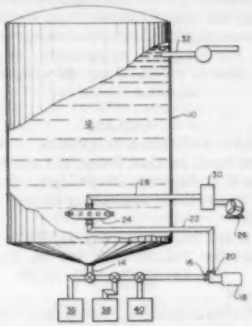
Filed Dec. 14, 1981, Ser. No. 330,157
Int. Cl.³ C12P *7/02*
U.S. Cl. 435—155 38 Claims

1. A method of converting an alkene or alkyne selected from the group consisting of allyl alcohol, 3-buten-1-ol, 3-buten-2-ol, 2-butene-1,4-diol, allyl chloride, allyl bromide, ethylene, propylene, propargyl alcohol 3-butyn-1-ol, 2-butyne-1,4-diol, methyl acetylene, 2-cyclohexen-1-ol and 1,3-butadiene to produce the corresponding vicinal dihalogenated product in an amount of at least 65% of the total product formed, said method comprising reacting said compound in an aqueous medium with a haloperoxidase enzyme in the presence of H_2O_2 and an alkali metal halide selected from the group consisting of alkali metal chloride, bromide, and iodide, at a halide ion concentration of at least 1 M.

4,426,450
FERMENTATION PROCESS AND APPARATUS

David M. Donofrio, Scotts Valley, Calif., assignor to Fermentec Corporation, Los Gatos, Calif.

Continuation-in-part of Ser. No. 295,566, Aug. 24, 1981, abandoned. This application Jan. 18, 1982, Ser. No. 340,062
Int. Cl.³ C12N 1/00, 1/16; C12P 7/06; C12M 1/04
U.S. Cl. 435—243 8 Claims



8. A continuous method for fermenting a fermentable substrate in an aqueous feed stream by inoculation with a microorganism, comprising the steps of:

(a) fermenting an aqueous medium of fermentable substrate in the presence of fermenting microorganisms in an aerobic fermentation vessel maintained under essentially aerobic conditions to grow additional microorganisms wherein the contents of the aerobic fermentation vessel are agitated and air is dispersed therein by removing liquid from the aerobic fermentation vessel and passing the liquid through a jet mixer means and thereafter into the aerobic fermentation vessel below the liquid surface level therein, wherein in the jet mixer means the liquid is pumped through a venturi restriction into a gas-liquid mixing chamber where it is mixed with air to form a gas-liquid mixture, and the gas-liquid mixture is passed through at least one nozzle and projected into the fermentation vessel at an angle of within 10° of the horizontal plane, and at a distance from the bottom of the fermentation vessel of from 20 to 50 percent of the total distance from the bottom of the fermentation vessel to the liquid surface level, the velocity of liquid through the venturi restriction and nozzle being sufficient to cause turbulent shear action in the mixing chamber and nozzle and fine bubble dispersion of gas in the liquid, and the velocity of the air-liquid mixture leaving the nozzle being sufficient to cause a mixing plume;

(b) directing an aqueous stream of microorganisms from said aerobic fermentation vessel to an anaerobic fermentation vessel;

(c) continuously flowing to said anaerobic fermentation vessel an aqueous feed constituting the main source of substrate to be fermented from a source which bypasses said aerobic fermentation vessel;

(d) fermenting a portion of said substrate in said anaerobic vessel while maintaining it under essentially anaerobic conditions;

(e) continuously withdrawing from said anaerobic vessel an aqueous product stream of fermented substrate and a substantial population of microorganism solids;

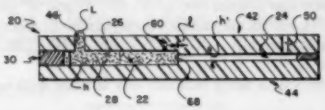
(f) separating said withdrawn stream into a fermented substrate stream and a stream including at least a substantial portion of said microorganism solids; and

(g) recycling at least a portion of said separated microorganism solids stream to both said aerobic fermentation vessel and said anaerobic fermentation vessel.

4,426,451
MULTI-ZONED REACTION VESSEL HAVING PRESSURE-ACTUATABLE CONTROL MEANS BETWEEN ZONES

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 28, 1981, Ser. No. 229,038
The portion of the term of this patent subsequent to Jan. 12, 1999, has been disclaimed.
Int. Cl.³ G01N 21/03, 33/54, 33/70
U.S. Cl. 436—518 42 Claims



35. A method for interacting with a reagent a material contained in a liquid, comprising the steps of

(a) filling with liquid a first zone of a device comprising two adjacent zones fluidly connected by a passageway, both of said zones comprising opposed liquid transport surfaces, two of said surfaces being spaced apart a distance that is effective to induce capillary flow of said introduced liquid at least in the portion of said first zone contiguous to said passageway, and in said second zone, at least one of said zones further including said reagent;

(b) retaining the liquid within said first zone while the reagent interacts with said material; and thereafter,

(c) applying to the liquid in said first zone an externally generated pressure in an amount sufficient to force the liquid to start flowing under capillary attraction into said second zone, whereby the liquid flows into the second zone.

4,426,452
VOLATILE METAL CARBONYL ANALYSIS

Bernard A. Lasoski, Mantua, N.J., assignor to Syngas Company, Deer Park, Tex.

Filed May 27, 1982, Ser. No. 382,571
Int. Cl.³ G01N 31/08, 23/08
U.S. Cl. 436—76 3 Claims

1. A method of measuring the volatile metal carbonyl content of a fluid stream comprising,

(a) obtaining a sample of the fluid stream,

(b) feeding the sample with a carrier stream into an on-column glass column in a gas chromatograph wherein the components of the sample are separated, the column being operated at 23°–40° C. and containing squalane as the stationary liquid phase for separation, and

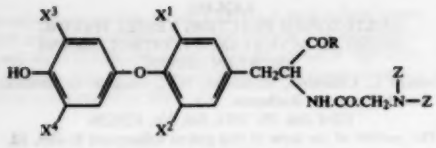
(c) the stream from the glass column feeding into a constant current, electron capture detector where the metal carbonyl content is detected and a signal produced.

4,426,453
DERIVATIVES OF IODOTHYRONINE COMPOUNDS AND THEIR USE IN AN ASSAY FOR THE FREE IODOTHYRONINE COMPOUNDS

Gavin M. Cree, Chalfont St. Giles; Terence A. Wilkins, Chesham; Reginald Monks, Great Missenden, and David P. Nowotnik, Aylesbury, all of England, assignors to Amersham International Limited, England

Filed Aug. 27, 1981, Ser. No. 297,086
Claims priority, application United Kingdom, Sep. 18, 1980, 8030260; Feb. 6, 1981, 8103673
Int. Cl.³ G01N 33/58, 33/60
U.S. Cl. 436—500 9 Claims

1. A derivative of an iodothyronine compound having the general formula



where

each of X^1, X^2, X^3, and X^4 is independently Cl, Br, I or H, with the provisos that at least one of X^1, X^2, X^3 and X^4 is I, and that at least two of X^1, X^2, X^3 and X^4 are halogen,

R is OH, amino, alkylamino, dialkylamino or alkoxyl, each Z is independently $-(CH_2)_n NZ_2$ or $-CH_2COR$, and n is 1, 2 or 3,

said derivative being radioactively labelled with iodine-125.

4,426,454

DIAGNOSTIC METHOD FOR IMMUNE DISORDERS

Tadao Aoki; Hideo Miyakoshi, both of Niigata, and Mikio Mizukoshi, Saitama, all of Japan, assignors to Fujirebio Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,544

Claims priority, application Japan, Mar. 26, 1980, 55-37504

Int. Cl.³ G01N *33/58*; G01T *1/00*; C12Q *1/29*

U.S. Cl. 436—504 **12 Claims**

1. A method for diagnosing, in a human being undergoing testing, the existence of an immune disorder of the type in which the peripheral blood lymphocytes of the human being produce a substantially lower amount of immunoglobulins than the peripheral blood lymphocytes of a normal healthy human being, comprising the steps of: culturing a sample of peripheral blood lymphocytes taken from the human being undergoing testing with a mitogenic substance selected from the group consisting of (1) a lysate prepared by sonic destruction of *Staphylococcus aureus* cells and (2) the soluble growth products of the metabolic activity of *Staphylococcus aureus* cells, under conditions effective to induce production of immunoglobulins or to produce DNA; then measuring either the amount of immunoglobulin or the amount of DNA in the sample; then comparing the measured value of immunoglobulin concentration or DNA in the sample with the corresponding value obtained when the peripheral blood lymphocytes of a normal healthy human being are tested in the same way, a low value of immunoglobulin or DNA production for the sample relative to the corresponding value for a normal healthy human being indicating the presence of an immune disorder in the human being undergoing testing.

4,426,455

ASSAY OF VITAMIN B12

Keith C. Tovey, and David T. Carrick, both of Amersham, England, assignors to Amersham International Limited, England

Filed Sep. 9, 1981, Ser. No. 300,979

Claims priority, application United Kingdom, Sep. 22, 1980, 8030544

Int. Cl.³ G01N *33/54*, *33/56*, *33/58*

U.S. Cl. 436—505 **10 Claims**

1. A method of assaying for vitamin B_{12} in serum comprising the steps

(a) mixing a sample of the serum to be assayed with alkali, cyanide, and a dithiopolyol having from 4 to 6 carbon atoms.

(b) incubating the mixture at a pH of at least 12 and a temperature not exceeding 50° C. for a time sufficient to separate the vitamin B_{12} from serum binding proteins and to substantially denature the proteins,

(c) providing in the mixture, either before, during or after performing step (b), a standard amount of radioactively labelled vitamin B_{12}, and a vitamin B_{12} analogue which binds strongly to serum binding proteins of the sample but not to intrinsic factor,

(d) reducing the pH of the incubated mixture from step (b), adding thereto a standard amount, insufficient to bind all the vitamin B_{12} in the sample and the radioactively labelled vitamin B_{12}, of intrinsic factor, and

(e) incubating the mixture to cause a fraction of the vitamin B_{12} in the sample and a fraction of the radioactively labelled vitamin B_{12} to become bound to the intrinsic factor, separating the bound fraction from the fraction not so bound, measuring the level of radioactivity of at least one fraction, and using the measurement to determine the concentration of vitamin B_{12} in the sample.

4,426,456

FREEZE/THAW DURABLE SULPHUR COMPOSITIONS

Jack E. Gillott; Ian J. Jordaan; Robert E. Loov; Nigel G. Shrive, and Michael E. D. Raymont, all of Calgary, Canada, assignors to Sulphur Development Institute of Canada (SUDIC), Calgary, Canada

Continuation of Ser. No. 186,519, Sep. 12, 1980, abandoned. This application Feb. 26, 1982, Ser. No. 352,472

Int. Cl.³ C04B *21/02*, *35/00*

U.S. Cl. 501—84 **47 Claims**

1. A composition comprising a particulate mineral aggregate and a sulphur component selectd from the group consisting of elemental sulphur, modified sulphur and mixtures thereof, and a plurality of fine entrained substantially spherical cells uniformly dispersed throughout the composition, said sulphur component being present in an amount of 5 to 60%, by weight, of said composition and said cells comprising gas cells with cell walls defined by the sulphur component.

4,426,457

REFRACTORY POWDER AND METHOD OF PRODUCING SAME

Leonid F. Zhukov, and Evgeny G. Chugunny, both of Kiev, U.S.S.R., assignors to Institut Problem Litiya Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

PCT No. PCT/SU80/00132, § 371 Date Mar. 18, 1982, § 102(e) Date Mar. 18, 1982, PCT Pub. No. WO82/00461, PCT Pub. Date Feb. 18, 1982

PCT Filed Jul. 31, 1981, Ser. No. 361,902

Int. Cl.³ C04B *35/10*

U.S. Cl. 501—128 **21 Claims**

1. A method for producing a refractory powder composition comprising the following components, in wt.%:

aluminum oxide: 40–70

silicon dioxide: 29–59

sintering agent: 0.3–2.0

comprising heating the aluminum oxide powder and the silicon dioxide powder to elevated temperatures of from 1200° to 1400° and from 900° to 1200° C., respectively, then cooling to room temperature, and contacting with a sintering agent to provide a uniform mixture.

4,426,458

FIBER REINFORCED SULPHUR CONCRETES

Raymond T. Woodhams, Toronto, Canada, assignor to Sulphur Development Institute of Canada (SUDIC), Calgary, Canada

Filed Jul. 30, 1982, Ser. No. 403,802

Int. Cl.³ C04B *19/06*

U.S. Cl. 501—140 **15 Claims**

1. A composition comprising a mixture of a particulate mineral aggregate, a sulphur component in an amount effective to bind the aggregate, said sulphur component being selected from the group consisting of elemental sulphur, modified sulphur and mixtures thereof, and fibre elements having a length of at least 3 cm. dispersed throughout said mixture, said fibre elements being present in an amount effective to promote fracture toughness in said mixture and retard crack propagation, said fiber elements comprising bundles of filaments, said

bundles being coated with a binder coating effective to maintain bundle integrity.

4,426,459

PROCESS FOR DECOMPOSING VULCANIZED RUBBER

Yoji Watabe, Hachiohji; Hideo Takeichi, and Koichi Irako, both of Higashi Murayama, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1981, Ser. No. 235,521
Claims priority, application Japan, Feb. 25, 1980, 55-21587
Int. Cl.³ C08J 11/04
U.S. Cl. 521—42 5 Claims

1. A process for decomposing particles of compounded rubber which comprises swelling 100 parts by weight of the particulate rubber with 10–3000 parts by weight of an organic solvent for vulcanized rubber, and adding and mixing 0.1–20 parts by weight of an organic hydroperoxide (a) and 0.001–1 mol equivalent per said (a) of at least one strongly alkaline compound (b) selected from the group consisting of lithium hydroxide, sodium hydroxide, potassium hydroxide, and 1,8-diazabicyclo[5,4,0] undecene-7 and salts thereof, the decomposition being carried out at from 0° to 100° C.

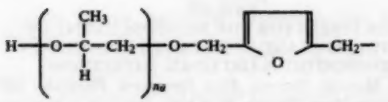
4,426,460

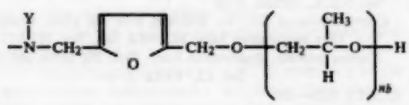
POLYURETHANES OR ISOCYANURATES FROM ALKOXYLATED HYDROXYMETHYLFURAN

William J. Pentz, Cary, Ill., assignor to Quaker Oats Company, Chicago, Ill.

Filed Aug. 10, 1981, Ser. No. 291,446
Int. Cl.³ C08G 18/14
U.S. Cl. 521—115 22 Claims

1. A method of trimerizing a composition which includes a polyfunctional isocyanate component and a polyfunctional polyol composition, said method including adding to said composition from about 0.5% to about 40% by weight of a Mannich diol composition adapted to serve, at least in part, as a trimerizing catalyst for said composition, and having the formula:





wherein n_a is from 1 to 4, n_b is 1 to 4, and wherein X is a C_1–C_6 alkyl group and permitting said components to react to from an isocyanurate-containing composition.

4,426,461

MODIFIED POLYISOCYANURATE FOAM AND METHOD OF PREPARATION

Stuart B. Smith, Conyers, Ga., assignor to Thermocell Development, Ltd., Knoxville, Tenn.

Filed Jul. 14, 1982, Ser. No. 398,369
Int. Cl.³ C08G 18/14, 18/18, 18/22, 18/30
U.S. Cl. 521—116 30 Claims

1. A modified polyisocyanurate foam composition, which foam consisting is prepared by:

reacting 100 parts by weight of a methylene diisocyanate with from about 5 to 40 parts by weight of a polyalkylene glycol composition comprising a C_1–C_3 alkoxy poly C_1–C_3 alkylene glycol, the reaction carried out in the presence of a blowing agent to form a foam composition, a surfactant and a single-stage, rapid, high-exotherm, trimerization catalyst, to produce a rigid foam composition having good fire resistance.

4,426,462

METHOD FOR THE PREPARATION OF HIGHLY ABSORBENT PHENOLIC RESIN FOAMS

Franz Weissenfels, Sieburg, and Walter Engels, Siegberg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Jul. 27, 1982, Ser. No. 402,453
Int. Cl.³ C08J 9/14
U.S. Cl. 521—116 8 Claims

1. Improvement in the preparation of open-pored phenolic resin foams by the foaming of intimate mixtures of water containing phenolic resol resins in the viscosity range of from 1000 to 20,000 cP, low-boiling organic liquids in which the phenolic resol resins are not soluble as blowing agents and acid-containing hardeners, the improvement comprising adding to the foamable phenolic resol resin before or during the preparation of this foamable mixture 1.0 to 6.0 weight-percent of ethoxylated castor oil and 0.5 and 5 weight-percent of an alkyl sulfate salt of the general formula

$$C_xH_{2x+1}—O—SO_3—Me^+$$

wherein x an integer from 8 to 18 and Me is an alkali metal or a triethanolamine cation.

4,426,463

MODIFIED POLYIMIDE FOAMS AND METHODS OF MAKING SAME

John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120, and John V. Long, 1756 E. Lexington Pl., El Cajon, Calif. 92021

Continuation-in-part of Ser. No. 390,778, Jun. 21, 1982. This application Apr. 15, 1983, Ser. No. 485,264
The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.
Int. Cl.³ C08J 9/22, 9/24, 9/32
U.S. Cl. 521—180 21 Claims

1. The method of making a resilient, flame resistant modified polyimide foam having a selected compressive resistance which comprises the steps of:

reacting an aromatic dianhydride with an oximine having the general formula:

$$CH_2—(CH_2)_x—NHCO$$

wherein "X" is an integer from 2 to 4, in a selected mole ratio of oxoimine to dianhydride between about 0.5:1 and about 0.05:1 to produce an N-substituted aliphatic imide;

dissolving said imide in a reactive solvent esterifying agent to exterify said imide;

adding thereto a diamine;

drying the resulting solution; and

heating the dry material to a selected foaming temperature of from about 120° C. to about 320° C. for a period of from about 10 to about 60 minutes;

whereby a resilient foam having a selected compressive resistance in accordance with the selected oxoimine to dianhydride mole ratio, the compressive resistance being inversely proportional to the oxoimine quantity.

4,426,464

MARINE PAINT

Cristian M. Sghibartz, Washington, England, assignor to International Paint Public Limited Company, London, England

Filed Jun. 29, 1982, Ser. No. 393,486

Claims priority, application United Kingdom, Jul. 3, 1981, 8120569

Int. Cl.[3] C08L 33/02

U.S. Cl. 523—122 8 Claims

1. A marine paint comprising a film-forming copolymer which is a copolymer containing 20 to 80 percent by weight of units of a quinolinyl or substituted quinolinyl ester of an olefinically unsaturated carboxylic acid, the balance of the copolymer being units of at least one olefinically unsaturated comonomer, and a metalliferous pigment which is sparingly soluble in sea-water.

4,426,465

COATING COMPOSITIONS FOR SOLAR SELECTIVE ABSORPTION COMPRISING A THERMOSETTING ACRYLIC RESIN AND PARTICLES OF A LOW MOLECULAR WEIGHT FLUOROCARBON POLYMER

Masao Maki, Nabari; Hiroshi Fukuda, Koriyama, and Seiichi Sano, Nara, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Feb. 18, 1982, Ser. No. 350,040

Claims priority, application Japan, Feb. 19, 1981, 56-24094

Int. Cl.[3] C09D 3/81, 5/32; B05D 5/00; B32B 15/08

U.S. Cl. 523—135 8 Claims

1. A coating composition for selective solar absorption which comprises a disperson, in a binder of a thermosetting acrylic resin, of particles of: an inorganic black pigment having a size ranging from 0.01 to 0.5 microns and selected from the group consisting of oxides and double oxides of Fe, Mn, Cu, Cr, Co and Ni and mixtures thereof; and particles of a low molecular weight fluorocarbon resin containing in an amount of from 5 to 15 parts by weight per 100 parts by weight of the acrylic resin, the particles of the pigment being present in an amount of from 45 to 65 parts by weight per 100 parts by weight of the acrylic resin.

4,426,466

PAPER TREATMENT COMPOSITIONS CONTAINING FLUOROCHEMICAL CARBOXYLIC ACID AND EPOXIDIC CATIONIC RESIN

Craig A. Schwartz, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 9, 1982, Ser. No. 386,631

Int. Cl.[3] C14C 9/00; D21H 3/02, 3/58

U.S. Cl. 523—455 19 Claims

1. Sizing treatment compositions, comprising:

(a) fluoroaliphatic radical-containing carboxylic acid or a salt or hydrolyzable precursor thereof, and

(b) water-soluble epoxidic cationic resin comprising a reaction product of epihalohydrin with ammonia or aminopolymer.

4,426,467

FOUNDRY MOLDING COMPOSITIONS AND PROCESS

Ingmar P. Quist, Llantwit Major; Jeffrey D. Railton, Shirley Warren, and Peter H. R. B. Lemon, Pandale, all of England, assignors to Borden (UK) Limited, Southampton, England

Filed Jan. 12, 1981, Ser. No. 224,131

Int. Cl.[3] C08K 3/36

U.S. Cl. 523—145 16 Claims

1. A foundry moulding composition comprising:

(a) a granular refractory material;

(b) about 0.8 to 5.0% of an alkaline phenolic resin based on the weight of the refractory material;

(c) about 25 to 110% of a lactone based on the weight of the penolic resin, said composition is capable of setting at ambient temperatures.

4,426,468

SEALANT COMPOSITION

Joel V. Ornum, Kirkland, and Jessie T. Chiu, Bellevue, both of Wash., assignors to Rockcor, Inc., Redmond, Wash.

Continuation of Ser. No. 298,137, Aug. 31, 1981, abandoned, which is a continuation of Ser. No. 156,125, Jun. 3, 1980, abandoned, which is a continuation of Ser. No. 949,451, Oct. 10, 1978, abandoned. This application Aug. 30, 1982, Ser. No. 413,197

Int. Cl.[3] C08L 23/22

U.S. Cl. 523—166 19 Claims

1. A butyl rubber based sealant composition, the butyl rubber constituent of which is present only in the form of a copolymer having a viscosity average molecular weight in excess of 100,000, comprising the reaction product of said butyl rubber, a curing system including a cross-linking agent selected from the group consisting of at least 2 parts by weight of a quinoid cross-linking agent per hundred parts butyl rubber and at least 5 parts by weight of a phenolic cross-linking agent per hundred parts butyl rubber, and at least one tackifier compatible with butyl rubber, and a filler material, the composition being compounded such that it has a tensile strength of at least 30 psi, an elongation of at least 600% and a cross-link density such that its swell ratio in toluene is between 12 and 40.

4,426,469

GLASS FIBERS FOR THE REINFORCEMENT OF POLYOLEFINS AND REINFORCED POLYOLEFIN COMPOSITIONS OBTAINED THEREFROM

Roberto Marzola, Ferrara; Enea Garagnani, Piumazzo, and Alessandro Moro, Pernate, all of Italy, assignors to Montedison S.p.A., Milan, Italy

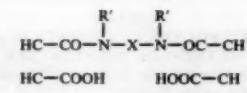
Continuation of Ser. No. 235,848, Feb. 19, 1981, abandoned. This application May 24, 1982, Ser. No. 381,575

Claims priority, application Italy, Feb. 20, 1980, 20034 A/80

Int. Cl.[3] C08K 3/40

U.S. Cl. 523—209 7 Claims

1. Glass fibers for the production of reinforced polymers, characterized in that said fibers have a coating comprising, besides a polyolefinic film-forming agent and a silane, also a bis-maleamic acid of general formula:



wherein X is a group $(CHR)_n$ in which n is an integer from 2 to 18 and R is hydrogen or an alkyl with 1–6 carbon atoms, or X is a bivalent cycloaliphatic or aromatic group also having several nuclei, or a heterocyclic group; R' is hydrogen, the two R's together being also capable of forming a group $(CHR)_n$ when X is $(CHR)_n$; said coating being obtained by passing the fibers, after their leaving the spinneret, through an aqueous finishing bath containing, by weight, from 0.5 to 10% of polyolefinic film-forming agent, from 0.01 to 3% of silane and from 0.01 to 3% of bis-maleamic acid.

4,426,470

AQUEOUS METHOD OF MAKING REINFORCED COMPOSITE MATERIAL FROM LATEX, SOLID POLYMER AND REINFORCING MATERIAL

Ritchie A. Wessling, Midland; Larry D. Yats, Clare, both of Mich., and Darryl K. Tolbert, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 399,077, Jul. 16, 1982, abandoned, which is a continuation of Ser. No. 286,793, Jul. 27, 1981, abandoned. This application Sep. 16, 1982, Ser. No. 418,934

Int. Cl.³ C08K *3/40, 7/14;* C08L *1/00;* B32B *17/08*

U.S. Cl. 524—35 26 Claims

1. Process for making a composite, which is capable of being heat fused into a reinforced polymer sheet, which comprises

A. forming a dilute aqueous slurry of

(1) from about 19 to about 79 percent of solid heat fusible organic polymer particles,

(2) from about 10 to about 80 percent of a reinforcing material and

(3) from about 1 to about 10 percent of a latex binder of a substantially water-insoluble organic polymer having either anionic or cationic bound charges, the percentages being by weight based on a dry solids basis, and

B. flocculating the slurry during agitation with a polymeric flocculant opposite in charge to that of the latex binder,

C. collecting the solids in the form of a mat,

D. dewatering and

E. drying.

4,426,471

STABILIZATION OF ACID CATALYZED STOVING LACQUERS

Godwin Berner, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 211,480, Nov. 28, 1980, Pat. No. 4,344,876, which is a continuation-in-part of Ser. No. 47,407, Jun. 11, 1979, abandoned. This application Jun. 25, 1982, Ser. No. 392,424

Claims priority, application Switzerland, Jun. 21, 1978, 6752/78

Int. Cl.³ C08K *5/34;* C09D *3/28, 3/81*

U.S. Cl. 524—91 23 Claims

1. A stablilized stoving lacquer composition comprising

(a) an acid catalyzed stoving lacquer based on hot crosslinkable acrylic, polyester or alkyd resins,

(b) an N-substituted 2,2,6,6-tetraalkylpiperidine compound or its acid addition salt,

(c) a UV absorber selected from the group consisting of the benzophenones, benzotriazoles, acrylic acid derivatives, organic nickel compounds and oxanilides, and

(d) a phenolic antioxidant.

4,426,472

LIGHT STABILIZATION OF METALLIC LACQUERS

Godwin Berner, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 221,590, Dec. 31, 1980, abandoned, which is a continuation of Ser. No. 971,271, Dec. 20, 1978, abandoned. This application May 6, 1982, Ser. No. 375,416

Claims priority, application Switzerland, Dec. 30, 1977, 16297/77; Apr. 28, 1978, 4651/78

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.³ C09D *3/28, 3/81*

U.S. Cl. 524—99 14 Claims

1. A method of stabilizing metallic stoving lacquers based on hot-crosslinkable alkyd resins or acrylic resins against the action of light, moisture and oxygen comprising incorporating in said alkyd resin or acrylic resin an effective stabilizing amount of a 2,2,6,6-tetraalkylpiperidine compound, or of the acid addition salts or complexes with metal compounds thereof.

4,426,473

INTERFACIAL VISCOSIFICATION OF AQUEOUS ACID SYSTEMS UTILIZING SULFONATED IONOMERS

Dennis G. Peiffer, East Brunswick; Robert D. Lundberg, Bridgewater, both of N.J., and Thad O. Walker, Humble, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 3, 1982, Ser. No. 374,198

Int. Cl.³ C08K *5/05, 5/15*

U.S. Cl. 524—111 19 Claims

1. A process for forming a thickened aqueous acid fluid, said solution having a viscosity of at least about 50 cps which includes the steps of:

(a) forming a solvent system of an organic liquid and a polar cosolvent, said polar cosolvent being less than about 15 weight percent of said solvent system, a viscosity of said solvent system being less than about 1,000 cps;

(b) dissolving a water insoluble, free acid, or neutralized sulfonated polymer in said solvent system to form a polymeric solution, a concentration of said unneutralized or neutralized sulfonated polymer in said solution being about 0.01 to less than 0.4 weight percent, a viscosity of said solution being less than about 200 cps; and

(c) adding about 5 to about 500 volume percent aqueous acid solution to said polymeric solution, said aqueous acid solution being immiscible with said polymeric solution, with said polar cosolvent and said water insoluble, neutralized sulfonated polymer transferring from said polymeric solution to said aqueous acid solution causing the viscosity of said aqueous acid solution to increase to at least 50 cps.

4,426,474

ORGANOPOLYSILOXANE COMPOSITIONS AND ELASTOMERS FORMED THEREFROM

Oswin Sommer; Norman Dorsch; Erhard Bosch, all of Burghausen; August Schiller, Neuötting, and Alois Strasser, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 29, 1982, Ser. No. 372,905

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121984

Int. Cl.³ C08L *83/06*

U.S. Cl. 524—243 6 Claims

1. A composition which can be stored under anhydrous conditions, but when exposed to moisture at room temperature, crosslinks to form an elastomer comprising a diorganopolysiloxane having terminal condensable groups, a silicon compound having at least three hydrolyzable groups per molecule which are bonded to silicon, and at least one alkylenediamine in which at least one nitrogen-bonded hydrogen atom is substituted with a polyalkylene oxide.

4,426,475

STABILIZED POLYAMIDES

Bert Brassat; Hans-Josef Buysch; Heinrich Haupt, and Karl H. Hermann, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

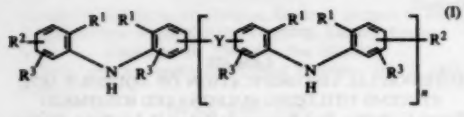
Filed Dec. 6, 1982, Ser. No. 446,943

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149763

Int. Cl.³ C08K *5/18*

U.S. Cl. 524—255 7 Claims

1. A stabilised polyamide containing from 0.02 to 5% by weight based on the polyamide of a diphenylamine compound corresponding to the following general formula:



wherein

R^1 represents hydrogen, methyl, ethyl or isopropyl;

R^2 represents hydrogen, C_4–C_{12} alkyl, C_7–C_{12} aralkyl or C_5–C_{12} cycloalkyl and is in the o- or p-position to the nitrogen atom;

R^3 represents hydrogen, methyl, ethyl or isopropyl and is in the o-, or m- or p-position to the nitrogen atom;

n represents an integer of from 1 to 29; and

Y represents C_4–C_{12} alkylene, C_7–C_{12} aralkylene or C_5–C_{12} cycloalkylene or up to 50 mole percent of —S—, —CH$_2$—S—CH$_2$—, —CH$_2$—O—CH$_2$ or =CH—R^4 wherein R^4 represents hydrogen, C_1–C_6 alkyl or C_5 or C_6 cycloalkyl and is in the o- or p-position to the nitrogen atom;

4,426,476

TEXTILE TREATMENTS

John C. C. Chang, New Brighton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 3, 1982, Ser. No. 345,408
Int. Cl.³ C08F 5/10
U.S. Cl. 524—288 **14 Claims**

1. Fluorochemical compositions comprising a mixture of:

(a) water-insoluble fluoroaliphatic radical- and aliphatic chlorine-containing ester; and

(b) water-insoluble fluoroaliphatic radical-containing polymer.

4,426,477

THERMOPLASTIC RESIN COMPOSITION

Toshihito Yasumatsu, Fujiidera; Toshiaki Nakase, Hirakata; Toshinori Kubozuka, Kyoto, and Kaoru Kawabata, Yahata, all of Japan, assignors to Riken Vitamin Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1982, Ser. No. 407,805
Claims priority, application Japan, Aug. 21, 1981, 56-131236
Int. Cl.³ C08K 5/10; C08L 27/06, 31/06, 27/08
U.S. Cl. 524—306 **9 Claims**

1. A thermoplastic resin composition obtained by blending to a vinyl chloride resin composition or its homologous series resin composition, a glycerin ester represented by the following formula:

wherein R_1, R_2 and R_3 represent each an acyl group or a hydrogen atom, said acyl group comprises one having 2 carbon atoms and one consisting mainly of those having 10 to 14 carbon atoms, the acyl group having 2 carbon atoms is present in an amount, on the average, of up to 2 mol per mol of glycerin, the acyl group consisting mainly of those having 10 to 14 carbon atoms are present in an amount, on the average, of at least 0.9 mol per mol of glycerin and the total amount of the acyl groups is, on the average, 2.7 to 3.0 mol per mol of glycerin.

4,426,478

BRANCHED POLYESTER COATING COMPOSITIONS

Paul R. Noyes, Philadelphia, Pa., and Eugene G. Sommerfeld, Mt. Laurel, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 215,713, Dec. 15, 1980, which is a continuation-in-part of Ser. No. 123,069, Feb. 20, 1980, Pat. No. 4,298,724. This application Nov. 3, 1982, Ser. No. 439,015
Int. Cl.³ C08G 63/18; C08L 67/02; C09D 3/52, 3/66
U.S. Cl. 524—361 **20 Claims**

1. A solution

in at least one organic solvent of the group consisting of methyl ethyl ketone, methyl isobutyl ketone, acetone, dimethyl sulfoxide, isophorone, butyl diethylene glycol monobutyl ether, lower alkyl ethers of ethylene glycol and acetates, lower alkyl ethers of diethylene glycol and acetates, lower alkyl acetates, N-methyl pyrrolidone and diacetone alcohol

containing, at 20° C.,

at least 60% by weight of at least one polyester, said polyester being formed from at least four different organic moieties:

(1) at least one diol moiety having 2–14 carbons;

(2) at least one triol or higher polyol moiety having 3–14 carbons;

(3) at least one dibasic aromatic acid moiety; and

(4) at least one dibasic aliphatic acid moiety,

the mole ratio X_1 of total polyol to total polyacid being in the range of 1.25/1 to 1.8/1,

the mole ratio X_2 of diol to higher polyol being in the range of 0.8/1 to 1.5/1, and

the mole ratio X_3 of aromatic acid to total acid being in the range 0.3/1 to 0.8/1,

not all of X_1, X_2 and X_3 being at their extremes simultaneously such that said polyester is nongelling in an organic solvent at 85% solids at normal temperature.

4,426,479

POLY-P-PHENYLENE SULFIDE RESIN COMPOSITION AND FILM MADE THEREOF

Yukichi Deguchi; Shinichiro Miyaji, and Hiroaki Kobayashi, all of Ohtsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 8, 1982, Ser. No. 386,218
Claims priority, application Japan, Jun. 12, 1981, 56-89660
Int. Cl.³ C08K 3/18
U.S. Cl. 524—430 **3 Claims**

1. A biaxially oriented poly-p-phenylene sulfide film prepared from a resin composition comprising poly-p-phenylene sulfide as a principal component and 0.05 to 40 wt % based on the total weight of the composition of at least one component selected from the group consisting of fine zinc oxide particles and fine lead oxide particles, wherein particles not larger than one micron in diameter account for at least 10% of the total number of particles, and wherein the tensile strength of said film is not lower than 13 kg/mm^2 and not higher than 30 kg/mm^2 in both the longitudinal direction and the transverse direction.

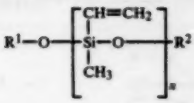
4,426,480

ORGANO SILOXANES, METHOD FOR THE PREPARATION THEREOF AND POLYMERIC COMPOSITIONS CONTAINING SAME

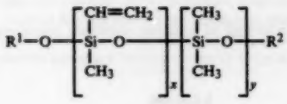
Herbert E. Petty, Bethel, Conn., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 361,632, Mar. 26, 1982, abandoned. This application Feb. 17, 1983, Ser. No. 467,572
Int. Cl.³ C08K 3/34
U.S. Cl. 524—445 **21 Claims**

1. An organo siloxane having the average formula:



wherein R^1 and R^2 are hydrocarbon radicals having 6 to 18 carbon atoms and n is an integer having a value of 2 to 50; or having the average formula:



wherein R^1 and R^2 are as previously defined and x and y are integers each having a value of 2 to 50.

9. A polymeric composition containing an organic peroxide, filler and an organo siloxane as defined in claim 1.

10. A polymeric composition as defined in claim 9 wherein the filler is clay.

4,426,481

POLYMERIC MATRIX CONTAINING β-ELIMINATING POLYMER AND PROCESS FOR PREPARING SAME

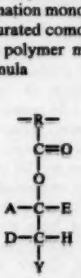
Charles I. Sullivan, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 130,532, Mar. 14, 1980, Pat. No. 4,297,431, which is a continuation-in-part of Ser. No. 942,490, Sep. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 774,599, Mar. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,140, Apr. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 487,228, Jul. 10, 1974, abandoned. This application Jul. 23, 1981, Ser. No. 285,936

Int. Cl.³ C08F 2/16

U.S. Cl. 524—460 **6 Claims**

1. A polymeric product adapted to utilization in a diffusion control layer, comprising a preformed aqueous emulsion polymer matrix material comprising recurring units from diacetone acrylamide, butylacrylate and acrylic acid, said matrix material having polymerized therein a polymer of a mixture of a β-elimination monomer capable of undergoing β-elimination in an alkaline environment and a copolymerizable ethylenically-unsaturated comonomer, said product having been obtained by polymerizing said β-elimination monomer and said copolymerizable ethylenically-unsaturated comonomer in the presence of said preformed emulsion polymer matrix, said β-elimination monomer having the formula



wherein R is an ethylenically unsaturated group of two or three carbon atoms; A, D and E are selected from the group consisting of hydrogen, methyl and phenyl provided that no more than one of A, E or D may be methyl or phenyl; and Y is an activating group which activates said β-elimination.

4,426,482

PROCESS FOR PRODUCING STABLE POLYMER EMULSIONS

Kenichi Kuramoto, Atsugi, and Hideaki Nakazawa, Higashi Yamato, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Nanyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,687

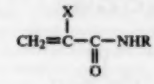
Claims priority, application Japan, Apr. 10, 1981, 56-53232

Int. Cl.³ C08F 2/22, 218/08, 210/02, 214/06

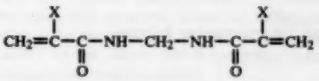
U.S. Cl. 524—460 **12 Claims**

1. A process for producing an aqueous polymer emulsion wherein a radically polymerizable monomer or monomers having an unsaturated bond are polymerized in an aqueous medium in the presence of a water-soluble copolymer, said process comprising using as the water-soluble copolymer a copolymer derived from a combination of:

(a) a nitrogen-containing compound having an ethylenically unsaturated bond represented by the formula (I) or (II):



(I)



(II)

wherein X is a hydrogen atom or a methyl group and R is a hydrogen atom or a methylol group,

with at least one compound selected from the group consisting of

(b-1) an unsaturated carboxylic acid or its salt, and

(b-2) an ethylenically unsaturated sulfonic acid or its salt.

4,426,483

ORGANIC PIGMENTS

William W. Maslanka, London-Britain Township, Chester County, Pa., and Gavin G. Spence, New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

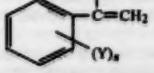
Division of Ser. No. 160,888, Jun. 19, 1980, Pat. No. 4,353,818, which is a division of Ser. No. 909,606, May 25, 1978, Pat. No. 4,235,982, which is a continuation-in-part of Ser. No. 803,330, Jun. 3, 1977, abandoned. This application May 11, 1982, Ser. No. 377,217

Int. Cl.³ C08F 2/16

U.S. Cl. 524—460 **8 Claims**

1. Water-insoluble graft copolymer particles consisting essentially of the free radical catalyzed graft copolymerization product of (1) at least one ethylenically unsaturated monomer (a) and at least one polyethylenically unsaturated monomer (b) in an amount at least sufficient to provide cross linked graft copolymer particles, and (2) a water-soluble cationic prepolymer having an RSV of about 0.1 to about 2.5 (1 M NaCl, 1%, 25° C.), the prepolymer moiety of the graft copolymer particles being present on the surface of the particles,

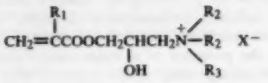
said monomer (a) being selected from the group consisting of methyl alpha-chloroacrylate, ethyl alpha-chloroacrylate, methyl methacrylate, isopropyl methacrylate, phenyl methacrylate, vinyl chloride, acrylonitrile, methacrylonitrile, and monomers having the formula



wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, said monomer (b) being selected from the group consisting of divinylbenzene; diallyl phthalate;

ethylene glycol dimethacrylate; 1,3-butylene glycol dimethacrylate; 1,6-hexanediol dimethacrylate; polyethylene glycol dimethacrylate; polypropylene glycol dimethacrylate; trivinylbenzene; divinylnaphthalene; diallyl maleate; diallyl fumarate; trimethylol propane trimethacrylate; and pentaerythritol tetraacrylate, and said prepolymer (2) being the addition polymerization product of

(i) about 5 mole percent to 100 mole percent of a cationic monomer having the formula

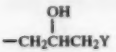


wherein

R_1 is hydrogen or methyl,

R_2 is hydrogen or a C_1–C_4 alkyl,

R_3 is hydrogen, a C_1–C_4 alkyl,



where Y is hydroxyl or halogen,

and $-(CH_2CH_2O)_nH$ where n is an integer 1 or more and X^- is an anion, and

(ii) from about 95 mole percent to 0 mole percent of at least one monoethylenically unsaturated amide monomer, the amount of prepolymer (2) employed in preparing the graft copolymer particles being from about 1 part to about 25 parts by weight for each 100 parts by weight of monomers (1) employed.

4,426,484

METHOD FOR ACCELERATING CURE OF RESOLE TYPE PHENOLIC RESINS

Yukio Saeki, and Katsuyuki Tanaka, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,375

Claims priority, application Japan, Oct. 21, 1980, 55-146339

Int. Cl.³ C08L *61/10, 61/12, 61/14*

U.S. Cl. 524—541 **7 Claims**

1. A resin composition comprising a phenol-aldehyde resole resin that is solid at ambient temperature, and about 0.3 to 20 parts by weight of a phenol-aldehyde novolac resin that is solid at ambient temperature based upon 100 parts by weight of said resole resin, wherein about 50 to 100 percent of the phenolic component of said novolac resin is resorcinol.

4,426,485

POLYMERS WITH HYDROPHOBE BUNCHES

Kenneth L. Hoy, St. Albans, and Richard C. Hoy, South Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 14, 1982, Ser. No. 388,202

Int. Cl.³ C08L *33/08, 75/08*

U.S. Cl. 524—591 **40 Claims**

1. A water-soluble, thermoplastic, organic polymer having a weight average molecular weight of at least about 10,000 which comprises hydrophobic segments, each containing at least one monovalent hydrophobic group covalently bonded to the polymer, wherein the polymer has an amount of hydrophobe bunching comprising at least two monovalent hydrophobic groups per hydrophobic segment, sufficient to provide

for enhanced thickening of aqueous solutions containing the polymer.

4,426,486

CLEAR AQUAGEL POLYIMIDE FILM

Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 255,028, Apr. 17, 1981, Pat. No. 4,405,550. This application Jul. 6, 1982, Ser. No. 395,389

Int. Cl.³ C08L *79/08*

U.S. Cl. 524—600 **3 Claims**

1. A clear aquagel film comprising a polyimide matrix having uniformly dispersed therein an aqueous phase.

4,426,487

MIXTURES OF NCO PREPOLYMERS CONTAINING TERTIARY NITROGEN ATOMS AND THE USE THEREOF AS ADHESIVES OR COATINGS

Eberhard König, Kronberg; Rudolf Hombach, Leverkusen; Manfred Dollhausen, Odenthal, and Josef Pedain, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,924

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1981, 3139967

Int. Cl.³ C08L *75/12*

U.S. Cl. 524—710 **3 Claims**

1. A composition which is stable in storage in the absence of moisture comprising the following:

(a) 100 parts, by weight, of polyurethane prepolymers containing from about 0.1 to 0.5%, by weight, of incorporated tertiary nitrogen atoms, from about 3 to 15%, by weight, of structural units positioned in polyester chains corresponding to the following formula:

$$-O-CH_2-C(CH_3)_2-CH_2-O-$$

and from about 3 to 12%, by weight, of terminal isocyanate groups which are obtained by reacting:

(a1) polyisocyanates or polyisocyanate mixtures of the diphenyl-methane series with mixtures comprising:

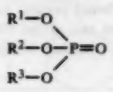
(a2) at least one linear or slightly branched polyester polyol having an OH number of from about 50 to 250 containing neopentyl glycol condensed therein and optionally, at least one linear or slightly branched polyester polyol having an OH number of from about 50 to 250 not containing neopentyl glycol condensed therein,

(a3) di- or tri-functional polyhydroxy polyethers having an OH number of from about 56 to 500, containing tertiary amino nitrogen atoms, and optionally in admixture with neutral, di- or tri-functional polyhydroxy polyethers having an OH number of from about 28 to 500, and, optionally,

(a4) di- or tri-hydric alcohols having an OH number of from about 500 to 1810 wherein the NCO:OH equivalent ratio is from about 1.7:1 to 5:1.

(b) from about 3 to 25 parts, by weight, of at least one phos-

phoric acid ester corresponding to the following general formula:



wherein

R^1, R^2 and R^3, which may be the same or different, each represents an optionally C_1-C_{12} alkyl-substituted phenyl radical or a saturated aliphatic hydrocarbon radical having from 6 to 18 carbon atoms; and

(c) from about 5 to 50 parts, by weight, of one or more inert solvents having a boiling point of from about 40° to 140° C.

4,426,488

ELASTOMERIC COMPOSITION

Ransome J. Wyman, 821 Camino Colibri, Calabasas, Calif. 91302

Filed May 20, 1982, Ser. No. 380,367
Int. Cl.³ C08K *3/22*
U.S. Cl. 524—783 **17 Claims**

1. An elastomeric composition formedf as a reaction product of a polyol, an organic polyisocyanate, a liquid carrier including water in stoichiometric excess of that required to polymerize the polyol and the isocyanate reactants and an alkaline absorbent for the carbon dioxide produced by the reaction, and including rubber particles distributed therethrough.

4,426,489

SURFACE ACTIVE POLYMERIC SURFACTANTS CONTAINING SIDE CHAIN HYDROPHOBES

Ritchie A. Wessling, Midland, and Dale M. Pickelman, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 123,321, Feb. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 901,924, May 1, 1978, abandoned. This application Jun. 10, 1981, Ser. No. 272,435
Int. Cl.³ C08F *26/00, 8/00*
U.S. Cl. 524—815 **2 Claims**

1. A method of reducing the surface tension of an aqueous medium having a polymeric surfactant dissolved therein, said polymeric surfactant (a) being a substantially linear, synthetic, water-soluble cationic interpolymer having a critical micelle concentration of 0.01 to about 10 percent in water at 25° C., a charge density of from about 1 to about 5 meq/g and a number average molecular weight of from about 500 to about 40,000; (b) being derived from the addition polymerization of one or more ethylenically unsaturated monomers and (c) being composed of a plurality of nonionic hydrophobic units and a plurality of pH independent hydrophilic cationic units which are randomly distributed in the backbone of said interpolymeric surfactant; said method comprising the use of the aforementioned type of polymeric surfactant in which a portion of the randomly distributed cationic units thereof contains a hydrophobic substituent thereon, said hydrophobic substituent being an alkyl group of from 8 to about 20 carbon atoms which is attached to a nitrogen atom and said portion of such cationic groups which is so substituted being such that an average of from 1 to about 5 of such hydrophobically substituted cationic groups are present per polymeric surfactant molecule.

4,426,490

CATALYZING EMULSION PAPER RELEASE COMPOSITIONS

Anthony J. Dallavia, Jr., Clifton Park; Gordon T. Van Vleck, and Frank J. Traver, both of Troy, all of N.Y., assignors to General Electric Co., Waterford, N.Y.

Filed Mar. 10, 1982, Ser. No. 356,796
Int. Cl.³ C08L *83/00*
U.S. Cl. 524—837 **4 Claims**

1. A method of polymerizing organosilicon compound

(1) containing at least one SiOH group and any remaining silicon valences in said organosilicon compound being satisfied by radicals selected from the group consisting of silicon-bonded oxygen atoms attached to other silicon atoms to form the siloxane linkage, silicon-bonded nitrogen radicals to form the silazane linkage, silicon-bonded sulfur radicals to form the Si—S—Si linkage, Si—Si linkage, and organic groups attached to the silicon through the SiC linkage selected from the group consisting of disilylalkylene, disilylarylene, disylhydrocarbon ether linkage, monovalent hydrocarbon, monovalent halohydrocarbon, monovalent hydrocarbon ether, nitrile-substituted monovalent hydrocarbon, ester substituted monovalent hydrocarbon, and monovalent hydrocarbon group substituted with an amino amido, and sulfide groups, there being on the average from 0.9 to 3 of said organic groups attached to the silicon which comprises contacting said organosilicon compound with

(2) a catalyst comprising dioctyl tin dineodeconate, at a temperature sufficient to cause an increase in the molecular weight of said organosilicon compound.

2. The method of claim 1 wherein the catalyst is in the form of an emulsion.

4,426,491

CURABLE PHYSICAL MIXTURES AND COMPOSITES THEREFROM

Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 23, 1980, Ser. No. 162,253
Int. Cl.³ C08J *5/10*
U.S. Cl. 524—878 **2 Claims**

1. A process for producing a fiber reinforced rigid article containing 15 to about 80 weight percent of fibers which process comprises adding a curable physical mixture comprising an active hydrogen containing compound selected from a polyol, a polyamine, an amino alcohol, or mixtures thereof, (b) an unsaturated carboxylic anhydride, and (c) an ethylenically unsaturated monomer into a mold cavity containing said fiber and curing the components therein.

4,426,492

DISPOSABLE, HYDROGEL SOFT CONTACT LENSES

Robert Steckler, Mission Viejo, Calif., assignor to Plastomedical Sciences, Inc., Briarcliff Manor, N.Y.

Filed Sep. 3, 1981, Ser. No. 298,865
Int. Cl.³ C08L *29/04*
U.S. Cl. 525—61 **12 Claims**

1. A method of preparing a stable, three dimensional Xerogel, which when immersed in dilute aqueous alkali at a pH of 7–11 absorbs water to form a water insoluble Hydrogel, which comprises: (I) introducing pendant carboxyl groups into (a) a water insoluble, linear vinyl polymer containing free hydroxyl groups and selected from the group consisting of vinyl alcohol-vinyl acetate copolymers composed, by weight, of from about 92.5% to about 53% vinyl acetate groups and from about 7.5% to about 47% vinyl alcohol groups and polyvinyl acetals, by heating a mixture of a major amount of said polymer and (b) a predetermined minor amount of an anhydride of a polybasic carboxylic acid to produce a carboxylated adduct of said polymer by reaction of free hydroxyl groups on said polymer with said anhydride to form monoesters of said polybasic acid with

said polymer containing free pendant carboxyl groups; and (II) thereafter sparingly crosslinking to a predetermined amount the thus obtained carboxylated adduct under anhydrous conditions by heating (c) said carboxylated adduct to a temperature and for a time to effect reaction between free hydroxyl groups and pendant carboxyl groups on said adduct to form ester groups, or (d) adding to and intimately admixing with said carboxylated adduct a predetermined minor amount of polyfunctional crosslinking agent, the functional groups of which are reactive with the hydroxyl or carboxyl groups of said adduct, and heating such mixture to a temperature and for a time to effect reaction between the functional groups on said crosslinking agent and said hydroxyl or carboxyl groups on said carboxylated adduct; the amount of said anhydride employed in said carboxylation step, the amount of crosslinking effected and amount of crosslinking agent employed in said crosslinking step being such amounts as are predetermined as needed to produce a Xerogel which when immersed in dilute aqueous alkali at a pH of 7–11 absorbs water and swells to form a water insoluble Hydrogel having a water content of about 48% to about 86%.

4,426,493

GRAFT POLYBLEND FLOW IMPROVERS FOR PVC

John C. Falk, Chicago, Ill., assignor to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Continuation of Ser. No. 100,624, Dec. 5, 1979, abandoned, which is a division of Ser. No. 932,585, Aug. 10, 1978, Pat. No. 4,212,958, which is a continuation of Ser. No. 690,112, May 26, 1976, abandoned. This application Aug. 7, 1981, Ser. No. 290,761

Int. Cl.³ C08L *51/06*

U.S. Cl. 525—84 **3 Claims**

1. A thermoplastic composition comprising a blend of 100 parts by weight of a polyvinyl halide selected from the group consisting of homopolymers of vinyl chloride and copolymers thereof containing at least 80% by weight vinyl chloride, and from 3 to 25 parts by weight of a polyblend composition comprising from 50 to 90% by weight of a rubbery mono-olefin polymer substrate selected from the group consisting of rubbery ethylenepropylene copolymers and rubbery ethylene-1-butene copolymers, and correspondingly from 50 to 10% by weight of a graft phase formed by graft polymerizing in the presence of said rubbery substrate a monomer mixture consisting of an acrylate grafting monomer and a vinyl aromatic grafting monomer said acrylate grafting monomer being selected from the group consisting of methyl acrylate, ethyl acrylate, methyl methacrylate and mixtures thereof, and said vinyl aromatic grafting monomer being selected from the group consisting of styrene, alpha methyl styrene, vinyl toluene and mixtures thereof.

4,426,494

UNSATURATED ETHYLENE POLYMERS AND PROCESSES FOR PREPARING AND FOR USING SAME

Marvin L. Beasley, Alva, Okla., and J. B. Brennan, Waldwick, N.J., assignors to Resdev, Inc., Alva, Okla.

Division of Ser. No. 113,092, Jan. 17, 1980, Pat. No. 4,303,763. This application Aug. 3, 1981, Ser. No. 289,253

Int. Cl.³ C08L *23/26*

U.S. Cl. 525—86 **14 Claims**

1. A process for cross-linking two ethylene polymers, comprising the step of reacting an unsaturated polyethylene prepared by the process of:

(a) mixing pulverized low- or medium-denisty saturated, linear polyethylene with liquid conjugated diene monomer having from 4 to about 10 carbon atoms and being present in an amount up to about 5 weight percent of the mixture;

(b) bringing said mixture to a temperature that melts the polyethylene; and

(c) maintaining said melt temperature until the polyethylene melts, said mixing, bringing and maintaining being without chemical or irradiant initiation;

with a saturated, linear polyethylene in the melt phase, the saturated polyethylene being present in an amount of between about 20 weight percent and about 40 weight percent of the melt composition, said reacting being without chemical or irradiant initiation.

4,426,495

PREPARATION OF STAR POLYMERS

Francis J. Vitus; Ivan G. Hargis, both of Tallmadge; Russell A. Livigni, and Sundar L. Aggarwal, both of Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 282,671, Jul. 13, 1981, Pat. No. 4,409,368. This application Sep. 22, 1982, Ser. No. 421,700

Int. Cl.³ C08L *67/06*

U.S. Cl. 525—92 **6 Claims**

1. A thermosetting composition selected from the group consisting of thermosetting polyester resins and thermosetting vinyl ester resins containing crosslinking monomers and having from about 5 to 15% by weight based on the total weight of the composition of a rubbery star copolymer having an average of from about 4 to 9 arms, having a Mn of from about 50,000 to 250,000, comprising from about 10 to 40% by weight of styrene and from 90 to 60% by weight of butadiene-1,3 and having a nucleus from an initiator (1) having a VPO Mn of from about 750 to 4,000, (2) having from 4 to 9 C-Li sites and (3) being the adduct of an aromatic compound selected from the group consisting of divinyl benzene and diisopropenyl benzene and mixtures thereof and RLi where R is selected from the group consisting of normal, secondary and tertiary alkyl and cycloalkyl radicals of from 2 to 20, or from 2 to 10, carbon atoms and mixtures thereof, the mole ratio of RLi to said aromatic compound being about 1:0.83.

4,426,496

POLY(ALLYL)POLY(ALKENYLPHENOL) POLYMER COMPOSITIONS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 28, 1982, Ser. No. 437,249

Int. Cl.³ C08L *67/00, 67/08, 77/12*

U.S. Cl. 525—168 **30 Claims**

1. A composition which is thermosettable upon curing with a curing quantity of a suitable curing agent, which thermosettable composition comprises,

(1) from 5 to about 95 percent by weight (pbw) of at least one resin composition selected from the group consisting of

(a) unsaturated polyester resins,

(b) unsaturated polyesteramide resins,

(c) dicyclopentadiene modified unsaturated polyester resins,

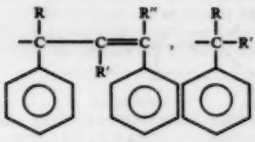
(d) dicyclopentadiene modified unsaturated polyesteramide resins, and

(e) vinyl ester resins,

(2) from zero to about 95 pbw of at least one polymerizable ethylenically unsaturated monomer; and

(3) from about 1 to about 50 pbw of a composition represented by any of formulas I through VIII in the specification;

wherein each A is a group represented by the formula —CH_2—CH=CH_2 (allyl); each R, R′ and R″ is independently hydrogen or an alkyl group having from 1 to about 3 carbon atoms; each X is independently an alkyl group having from 1 to about 4 carbon atoms, chlorine or bromine with the proviso that at least one X on each ring is chlorine or bromine; each X′ is independently chlorine or bromine; Q is independently a group derived from any suitable polymerization initiator or terminator, —H,



and wherein each aromatic ring may contain any substituent group as those enumerated as substituent groups in Formulas I through VIII; n has a value from about 5 to about 100, preferably from about 15 to about 80; n' has a value of from about 1 to about 99, preferably from about 1 to about 30; n'' has a value of from about 1 to about 99, preferably from about 30 to about 99; x has a value from zero to 4; x' has a value of from zero to 3; x'' has a value of zero to 2; y has a value of 1 or 2; z has a value from 0 to about 100; z' has a value of from 0 to about 100 and z'' has a value from about 1 to about 100 and wherein the pbw of the individual components is based upon total composition.

4,426,497

POLYMER MIXTURES COMPRISING POLYETHYLENE AND 1,4 POLYBUTADIENE

Eric G. Kent, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Mar. 18, 1982, Ser. No. 359,254

Claims priority, application Canada, May 1, 1981, 376722

Int. Cl.³ C08L *23/26, 23/06, 9/00*

U.S. Cl. 525—194 **10 Claims**

1. A polymeric covering material which is prepared by crosslinking by reaction with an organic peroxide at a temperature of from about 125° to about 175° C. or by treatment with radiation and which contains per 100 parts by weight of polymeric materials from about 60 to about 95 parts by weight of a polyethylene and from about 5 to about 40 parts by weight of a polybutadiene having from about 90 to about 97 percent of cis-1,4 structure.

4,426,498

POLYETHYLENE COMPOSITION COMPRISING LLDPE AND RUBBER

Hiroshi Inoue, Ooi; Masaaki Isoi, Ogose, and Kazuo Sei, Yokohama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,399

Claims priority, application Japan, Apr. 7, 1981, 56-51099

Int. Cl.³ C08L *23/08, 23/20*

U.S. Cl. 525—240 **7 Claims**

1. A polyethylene composition which comprises:

(a) from 70 to 98 parts by weight of linear low density polyethylene comprising a copolymer of ethylene and an alpha-olefin having a density of 0.915 to 0.935 and Mw/Mn ratio of 3 to 12; and

(b) from 2 to 30 parts by weight of an ethylene-butene-1 copolymer rubber having a density lower than 0.9.

4,426,499

PROCESS FOR THE PRODUCTION OF GRAFT POLYMERS

Siegfried Korte, Leverkusen; Christian Lindner, Cologne; Carl-hans Süling, Odenthal, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,486

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104101

Int. Cl.³ C08F *279/04*

U.S. Cl. 525—316 **7 Claims**

1. A process for the production of a graft polymer which comprises polymerizing (A) from 95 to 40 parts, by weight, of at least one ethylenically unsaturated monomer in the presence of (B) from 5 to 60 parts, by weight, of an at least partially cross-linked rubber in the form of an aqueous latex containing particles having an average diameter of more than 0.05 μm and having a solids content of at least 20%, by weight, the polymerization being carried out in a reaction medium comprising an aliphatic hydrocarbon at a temperature of from 30° to 100° C. and in the presence of a radical-forming initiator, and isolating sedimented graft polymer particles having a diameter of from 5 to 1000 μm.

4,426,500

POLYMER SOLUBILIZATION

Timothy W. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 23, 1982, Ser. No. 410,686

Int. Cl.³ C08F *283/00*

U.S. Cl. 525—537 **16 Claims**

1. A process for solubilizing (depolymerizing) arylene sulfide polymers which comprises contacting same with a solution comprising a metal halide selected from the halides of aluminum, gallium, and indium and at least one aromatic solvent having from 6 to about 10 carbon atoms per molecule and a boiling point less than about 260° C. at atmospheric pressure selected from aromatic hydrocarbons and and halogenated derivatives thereof having up to 4 halogen atoms, and optionally in admixture with a normally liquid paraffin or cycloparaffin having up to 10 carbon atoms per molecule, under conditions of temperature and pressure which solubilize said arylene sulfide polymer and form a solution comprising a complex mixture of arylene sulfides.

4,426,501

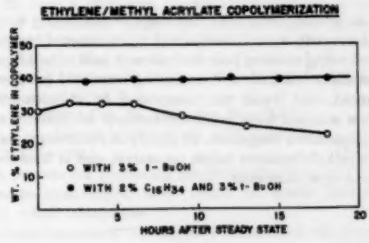
EMULSION COPOLYMERIZATION PROCESS USING COMONOMER SOLUBILITY AFFECTING ADDITIVES

Ausaf A. Khan, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 17, 1983, Ser. No. 458,660

Int. Cl.³ C08F *2/22, 210/02, 214/18*

U.S. Cl. 526—206 **12 Claims**



1. In a process for copolymerizing in an aqueous emulsion at least two but no more than three comonomers having different solubilities in water, the monomer combinations being selected from the following classes:

(1) ethylene with at least one of methyl acrylate, ethyl acrylate, vinyl acetate, methyl methacrylate, and glycidyl methacrylate; and

(2) one of ethylene, propylene, propylene, and isobutylene with one of tetrafluoroethylene and chlorotrifluoroethylene and with about 0–2 mole % of a copolymerizable vinyl monomer which is free of telogenic activity, and which incorporates into the copolymer a side chain containing at least two carbon atoms, with the side chain

having only single bonds between elements, except that the side chains may consist essentially of aromatic rings;

the improvement of having present in the copolymerization medium at least two but no more than three comonomer solubility-affecting additives, at least one of which increases the solubility in water of one of the comonomers, while at least another one decreases the solubility in water of another comonomer;

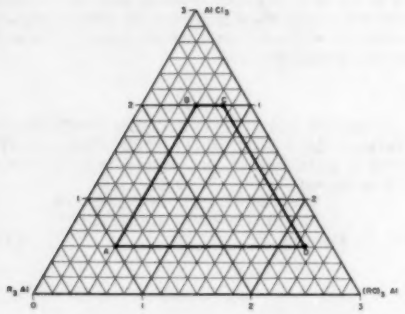
with the proviso that in the case of copolymerization of three comonomers, one of the comonomers may serve as the solubility-affecting additive for another comonomer, and when the solubility affecting additive is not one of the comonomers its amount is less than about 5 percent of the weight of water.

4,426,502

BULK POLYMERIZATION OF CYCLOOLEFINS

Robert J. Minchak, Parma Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 14, 1982, Ser. No. 387,920
Int. Cl.³ C08F 4/06
U.S. Cl. 526—172 **12 Claims**



1. A process comprising the steps of conveying a reactive liquid mix into a mold maintained at an elevated temperature whereby ring opening polymerization in bulk of said liquid mix is thermally initiated, and extracting a molded product from the mold; said liquid mix comprising an organoammonium catalyst selected from organoammonium molybdates and organoammonium tungstates, an alkoxyalkylaluminum halide or aryloxyalkylaluminum halide cocatalyst, and at least one norbornene-type monomer.

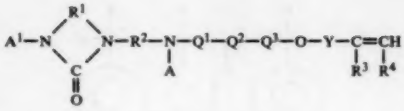
4,426,503

DERIVATIVES OF AMINOALKYL ALKYLENE UREAS AND THEIR USE AS WET ADHESION PROMOTERS

Joseph M. Sandri, Arnold; John W. Calentine, Pasadena; Seymour M. Linder, and Yves J. Billioux, both of Baltimore, all of Md., assignors to Alcolac Inc., Baltimore, Md.

Division of Ser. No. 157,238, Jun. 6, 1980, Pat. No. 4,319,032.
This application Dec. 14, 1981, Ser. No. 330,504
Int. Cl.³ C08F 26/06
U.S. Cl. 526—263 **15 Claims**

1. A composition polymerizable to form a latex copolymer for paint comprising a polymerizable mixture of at least one unsaturated monomer and at least one compound having the formula:



where

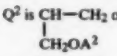
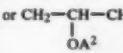
R^1 is alkylene having 2 to 3 carbon atoms;

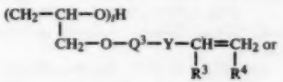
R^2 alkylene having 2 to about 10 carbon atoms;

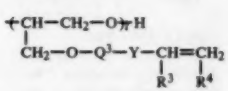
R^3 is H or CH_3;

R^4 is H or CH_3 and may be the same as or different from R^3;

Q^1 is $(R^5—O)_m$ where m is zero or an integer from 1 to about 100, and R^5 is a linear or branched alkylene, alkoxyalkylene, cycloalkylene, cycloalkoxyalkylene, arylalkylene, or aryloxyalkylene residue having 2 to about 20 carbon atoms;

Q^2 is  or  , where A^2 is H or

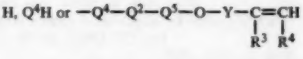




where t is zero or an integer from 1 to 10;

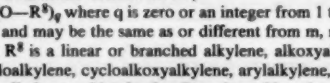
Q^3 is $(O—R^6)_n$ where n is zero or an integer from 1 to about 100 and may be the same as or different from m, and R^6 is a linear or branched alkylene, alkoxyalkylene, cycloalkylene, cycloalkoxyalkylene, arylalkylene or aryloxyalkylene residue having 2 to about 20 carbon atoms, and may be the same as or different from R^5;

Y is CH_2 or ;

A is H, Q^4H or 

where Q^4 is $(R^7—O)_p$ where p is zero or an integer from 1 to about 100 and may be the same as or different from m and n, and R^7 is a linear or branched alkylene, alkoxyalkyene, cycloalkylene, cycloalkoxyalkylene, arylalkylene, or aryloxyalkylene residue having 2 to about 20 carbon atoms, and may be the same as or different from R^5 or R^6;

Q^5 is $(O—R^8)_q$ where q is zero or an integer from 1 to about 100 and may be the same as or different from m, n and p, and R^8 is a linear or branched alkylene, alkoxyalkylene, cycloalkylene, cycloalkoxyalkylene, arylalkylene, or aryloxyalkylene residue having 2 to about 20 carbon atoms, and may be the same as or different from R^5, R^6 and R^7; and

A^1 is H,  or A

where Q^6 is $(R^9—O)_r$ where r is zero or an integer from 1 to about 100 and may be the same as or different from m, n, p and q, and R^9 is a linear or branched alkylene, alkoxyalkylene, cycloalkylene, cycloalkoxyalkylene, arylalkylene, or aryloxy-

yalkylene residue having 2 to about 20 carbon atoms, and may be the same as or different from R^5, R^6, R^7 and R^8; and

Q^7 is $(O—R^{10})_s$ where s is zero or an integer from 1 to about 100 and may be the same as or different from m, n, p, q and r, and R^{10} is a linear or branched alkylene, alkoxyalkylene.

4,426,504

FLEXIBLE DICYCLOPENTENYL OXYETHYL METHACRYLATE CURABLE COMPOSITIONS

Uma S. Nandi, Columbus, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Jun. 7, 1982, Ser. No. 385,515
Int. Cl.³ C08F *220/28*
U.S. Cl. 526—282 **8 Claims**

1. An acrylic curable composition of improved flexibility that cures rapidly at room temperature in the presence of an acrylic catalyst, which comprises on a curable weight percent solids basis:

(a) between about 70% and 95% dicyclopentenyl oxyethyl methacrylate, and

(b) between about 5% and 30% of a linear poly(oxyalkylene) glycol diacrylate or dimethacrylate cross-linking agent which contains from between about 4 to about 33 oxyalkylene groups per molecule.

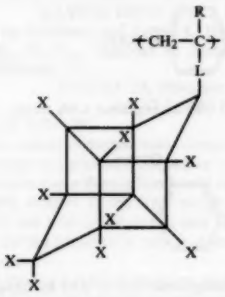
4,426,505

POLYMERS CONTAINING DECAHALOPENTACYCLODECYL GROUPS

Richard A. Minns, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 25, 1982, Ser. No. 352,085
Int. Cl.³ C08F *20/24, 20/58*
U.S. Cl. 526—283 **14 Claims**

1. A normally solid polymer comprising recurring units of the formula



wherein R is hydrogen or lower alkyl containing from 1 to 5 carbon atoms, L is a divalent linking group, and each X is independently chloro or bromo.

4,426,506

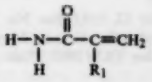
ALPHA-BETA UNSATURATED UREIDE POLYMERS, METHOD FOR MAKING SAME AND CURED ELASTOMERS PRODUCED THEREFROM

Fernando E. Blanco, Arleta, Calif., assignor to Products Research & Chemical Corp., Glendale, Calif.

Filed Sep. 16, 1982, Ser. No. 418,667
Int. Cl.³ C08G *71/02*
U.S. Cl. 526—302 **14 Claims**

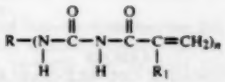
1. A method for producing a highly reactive liquid alpha-beta unsaturated ureide polymer having two to four terminal ureide groups which comprises:

forming a reaction mixture consisting essentially of (a) a liquid polymer reactant having two to four reactive isocyanate groups but no other groups reactive with alpha-beta unsaturated amides and having the formula $R—(NCO)_n$ wherein n is from 2 to 4 and R is the polymeric backbone of the polymeric reactant and (b) an alpha-beta unsaturated amide reactant having the formula:



wherein R_1 is hydrogen, lower alkyl or halogen and heating said reaction mixture to a temperature sufficient to cause reaction between said polymer reactant and said alpha-beta unsaturated amide reactant and maintaining said temperature until the reaction is substantially complete.

8. A liquid highly reactive alpha-beta unsaturated ureide polymer having the formula:



wherein R is a polymeric backbone having no groups reactive with alpha-beta unsaturated amides, n is from 2 to 4 and R_1 is hydrogen, lower alkyl or halogen.

4,426,507

PROCESS FOR PRODUCING (CO)-POLYMERS FROM α,β UNSATURATED ACID DERIVATIVES

Valentin N. Kiselnikov, ulitsa Pushkina, 2, kv. 1; Arkady A. Shubin, 4 Letny pereulok, 4, kv. 4; Vladislav V. Vyalkov, ulitsa Lezhnevskaya, 124-a, kv. 30; Vitaly A. Kruglov, ulitsa Parizhskoi Kommuny, 22, kv. 97; Tamara F. Loginova, ulitsa Pushkina, 47, kv. 56; Viktor S. Romanov, ulitsa Prostornaya, 15, kv. 42; Lev N. Ovchinnikov, ulitsa F. Engelsa, 117, kv. 9, all of Ivanovo; Valentin I. Varlamov, pereulok Shkolny, 2/38, kv. 88; Jury A. Makarov, pereulok Zhukovskogo, 3, kv. 19, both of Dzerzhinsk Gorkovskoi oblasti; Evgeny I. Penkov, prospekt Dzerzhinskogo, 4, kv. 44; Galina N. Shvareva, prospekt Pobedy, 16-a, kv. 41, both of Dzerzhinsk Gorkovskoi oblasti, and Vladimir N. Shtefan, ulitsa F. Engelsa, 22, kv. 17, Gorky, all of U.S.S.R.

Filed Feb. 19, 1981, Ser. No. 243,923
Int. Cl.³ C08F *22/02, 22/14, 22/38*
U.S. Cl. 526—303.1 **15 Claims**

1. A process for producing (co)polymers from acrylic and /or methacrylic acids, salts, esters or amide derivatives thereof, which comprises:

(a) (co)polymerizing the starting monomers in the presence of radical initiators at the decomposition temperature of said initiator until the appearance of the gel-effect and the formation of a low-molecular weight prepolymer, wherein the concentration of the starting monomers vary from about 40 to 100% by weight;

(b) cooling said prepolymer to the glass-transition temperature to yield a higher-molecular weight prepolymer with a degree of conversion of about 50 to 90%;

(c) granulating said prepolymer;

(d) treating said granulated prepolymer with a heating agent;

(e) drying and continuing polymerization of the granulated prepolymer in a fluidized bed heated with a heating agent;

(f) drying and continuing polymerization of the granulated prepolymer in a filtering bed heated with a heating agent to yield the final polymerization product.

4,426,508

CATALYTIC PREPARATION OF HIGH MOLECULAR WEIGHT POLYSILOXANES

Adrien Dromard, Paris, and Claude Millet, Saint-Priest, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed May 12, 1982, Ser. No. 377,589
Claims priority, application France, May 12, 1981, 81 09571
Int. Cl.³ C08G 77/06
U.S. Cl. 528—23 4 Claims

1. A process for the preparation of a high molecular weight polysiloxane, comprising polymerizing/rearranging a polysiloxane of lower molecular weight in the presence of a catalyst comprising

a porous, inorganic mineral particulate support having an average pore diameter in excess of 20 Å and a pore volume ranging from 0.2 to 2 ml/g, said porous support being coated with less than 15 mg/m² of a film of polymeric material comprising pendant sulfonic or phosphonic acid functions, and said polymeric material being characterized by an ion exchange capacity of less than 2 milliequivalents per gram.

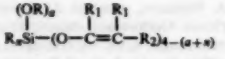
4,426,509

STORABLE CROSSLINKABLE ORGANOPOLYSILOXANE MOLDING COMPOSITIONS

Günther Maass, Berg.-Gladbach; Hans Sattlegger, Odenthal, and Hans J. Läcking, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 26, 1982, Ser. No. 411,750
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135185
Int. Cl.³ C08G 77/04
U.S. Cl. 528—34 3 Claims

1. In a plastic organosiloxane molding composition which in the absence of water is capable of being stored and in the presence of moisture is cross-linked to a rubber, the composition comprising a hydroxypolydiorganosiloxane, a base and heavy metal compound as cross-linking catalyst, and a cross-linking agent, the improvement which comprises employing as the cross-linking agent a silane compound of the formula



or a partial hydrolysis product thereof, wherein

R is an optionally substituted alkyl, alkenyl or aryl group,

R_1 is hydrogen or R,

R_2 is an acyl, carbalkoxy or carbaroxy group or R_1,

a is 1–3,

n is 0, 1 or 2, and

$a+n \leq 3$.

4,426,510

POLYURETHANE PREPARATION USING ORGANO-ZINC CATALYST AND TIME-LAPSE MODIFIER

Theodore A. DelDonno, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 5, 1982, Ser. No. 405,222
Int. Cl.³ C08G 18/16, 18/22
U.S. Cl. 528—49 20 Claims

1. Coating or adhesive composition having extended pot life and short cure time comprising an organic polyol, an organic polyisocyanate, an organo-zinc cure rate catalyst, and a compound effective to extend the pot-life selected from (a) beta-dicarbonyl compounds, (b) alpha-hydroxy ketones, (c) fused aromatic beta-hydroxy ketones, and (d) beta-hydroxy nitrogen-heterocyclic fused aromatics.

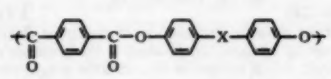
4,426,511

HEAT-RESISTING AROMATIC POLYESTER RESIN AND PROCESS FOR PREPARING THE SAME

Masahiro Asada, Kobe; Miyuki Matsuura, Nishinomiya, and Kazuya Yonezawa, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

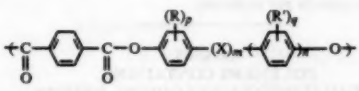
Filed Oct. 21, 1981, Ser. No. 313,670
Claims priority, application Japan, Oct. 24, 1980, 55-150004
Int. Cl.³ C08G 63/18
U.S. Cl. 528—128 12 Claims

1. An aromatic polyester resin comprising (a) recurring units of the following formula (I):



(I)

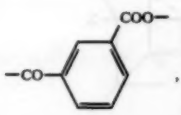
wherein X is a bivalent group selected from the group consisting of a bivalent hydrocarbon group having 1 to 10 carbon atoms, —O—, —S—, —SO_2— and —CO—, and (b) recurring units of the following formula (II):



(II)

wherein X is as defined above, R and R′ are a group selected from the group consisting of alkyl, aryl, aralkyl, alkoxyl, aryloxyl and phenylalkoxyl groups having 1 to 20 carbon atoms, and a mixture thereof, $p+q=1$ to 8, and m and n are 0 or 1, but n is not 0 when m is 1, provided that up to 10% by mole of the total of the units:

in the formulas (I) and (II) may be replaced with units:



the ratio of (a)/[(a)+(b)] being from 0.05 to 0.95 by mole.

4,426,512

POLYESTER CONTAINERS HAVING IMPROVED GAS BARRIER PROPERTIES

Robert B. Barbee, and Thomas H. Wicker, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,781
Int. Cl.³ C08G 63/18, 63/66, 63/68
U.S. Cl. 528—173 9 Claims

1. A polyester consisting essentially of the reaction product of;

(A) adiol containing up to about 8 carbon atoms, and

(B) a diacid component comprising (i) about 5 to 60 mole percent of a first diacid selected from the group consisting of [thiobis(p-phenyleneoxy)] diacetic acid, [sulfonyl-bis(p-phenyleneoxy)] diacetic acid, and mixtures thereof, and (ii) about 40 to 95 mole percent of terephthalic acid, wherein said polyester has an inherent viscosity of about 0.5 to 1.5 when measured at 25° C. in a 60/40 by weight

mixture of phenol/tetrachloroethane at a concentration of 0.5g/100 ml.

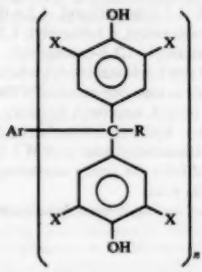
4,426,513

POLYCARBONATE RESINS BASED ON POLYPHENOLIC COMPOUNDS

Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed May 31, 1979, Ser. No. 44,039
Int. Cl.³ C08G 63/62
U.S. Cl. 528—204 **6 Claims**

1. A high molecular weight, thermoplastic, branched polycarbonate composition, based on a dihydric phenol, having an intrinsic viscosity of about 0.40 to 1.00 dl/g in methylene chloride at 25° C. wherein the branching component is derived from a polyphenolic compound of the formula



4,426,514

COPOLYCARBONATE FROM THIODIPHENOL HAVING HIGH MELT FLOW RATES

Sivaram Krishnan, and Arthur L. Baron, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 14, 1980, Ser. No. 168,857
Int. Cl.³ C08G 63/62
U.S. Cl. 528—204 **4 Claims**

1. A copolycarbonate resin comprising the reaction product of at least one aromatic dihydroxy compound, a carbonic acid derivative and a thiodiphenol, said thiodiphenol comprising 20 to 40% relative to the total weight of said dihydroxy compound and said thiodiphenol, said resin characterized by

(i) having a melt flow rate of at least 15 g/10 min. at 300° C., and

(ii) having a critical thickness greater than 200 mils, and

(iii) having its processing temperature below 500° F.

4,426,515

PROCESS FOR THE MANUFACTURE OF POLYURETHANES BY CARBONYLATION OF NITRATED HYDROXY-AROMATIC COMPOUNDS

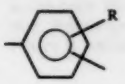
Jacques Kervennal, Lyons, and Jean-Marie Cognion, Saint Genis Laval, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Apr. 21, 1983, Ser. No. 487,260
Claims priority, application France, May 14, 1982, 82 08410
Int. Cl.³ C08G 71/04
U.S. Cl. 528—210 **9 Claims**

1. A process for the manufacture of polyurethanes by direct reaction in the liquid phase, comprising reacting carbon monoxide with a nitrated hydroxy-aromatic compound of the general formula:

$$HO—Ar—NO_2$$

wherein Ar represents the aromatic radical:



with the nitro and hydroxyl functional groups being in the para or meta positions with respect to each other and R represents hydrogen or halogen atoms or an alkyl group containing from 1 to 10 carbon atoms, said reaction being carried out in the presence of a catalyst comprising a precious metal of Group VIII of the Periodic Table at a temperature and for a time sufficient to form the polyurethane.

4,426,516

POLYESTER FIBER DYEABLE UNDER NORMAL PRESSURE

Tomio Kuriki, Katano, and Seiichi Manabe, Ibaraki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 30, 1982, Ser. No. 363,628
Claims priority, application Japan, Mar. 31, 1981, 56-46407; Mar. 31, 1981, 56-46408; May 14, 1981, 56-71358; May 14, 1981, 56-71360
Int. Cl.³ C08G 63/70
U.S. Cl. 528—272 **9 Claims**

1. A fiber consisting essentially of polyethylene terephthalate capable of being dyed under normal pressure and having an initial modulus at 30° C. of about 55 g/d to about 130 g/d, a relationship between a peak temperature [T_{max} (°C.)] at the peak of a dynamic mechanical loss tangent (tan δ) measured with a frequency of 110 Hz and a peak value of the dynamic mechanical loss tangent [$(\tan \delta)_{max}$] represented by the formula:

$$(\tan \delta)_{max} \geq 1 \times 10^{-2}(T_{max} - 105)$$

and a $(\tan \delta)_{max}$ of about 0.14 to about 0.30 and a dynamic mechanical loss tangent at 220° C. ($\tan \delta_{220}$) of at most about 0.055.

4,426,517

PROCESS FOR DE-CYANOETHYLATING BLOCKED NUCLEOTIDES

Hansen M. Hsiung, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 24, 1981, Ser. No. 295,420
Int. Cl.³ C07H 15/12, 17/00
U.S. Cl. 536—27 **5 Claims**

1. A process for selectively removing a β-cyanoethyl blocking group from the phosphate moiety of a nucleotide or polynucleotide, which comprises treating said nucleotide or polynucleotide with diethyl amine.

4,426,518

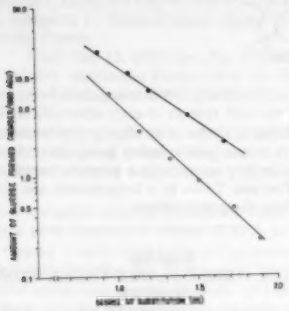
PROCESS FOR PRODUCING AN ALKALI SALT OF A CARBOXYMETHYLCELLULOSE ETHER

Takeo Omiya, Himeji, Japan, assignor to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Sep. 10, 1982, Ser. No. 416,751
Claims priority, application Japan, Sep. 10, 1981, 56-142731; Apr. 12, 1982, 57-60576
Int. Cl.³ C08B 11/00, 11/20
U.S. Cl. 536—98 **15 Claims**

1. A two stage process for preparing an alkali metal salt of carboxymethylcellulose ether, which comprises: in a first reaction stage, reacting cellulose, in the presence of an alkali in an aqueous organic solvent, with an etherifying agent effective to etherify said cellulose to form carboxymethylcellulose ether, wherein the entire amount of said etherifying agent is present

in the reaction mixture during the first reaction stage and the molar ratio of said alkali/said etherifying agent equal to



$$\frac{\left(\begin{array}{c}\text{number of moles of}\\ \text{alkali charged}\end{array}\right) - \left(\begin{array}{c}\text{number of moles of}\\ \text{alkali neutralized with}\\ \text{etherifying agent}\end{array}\right)}{\text{number of moles of etherifying agent charged}}$$

is in the range of from 0.10 to 0.99 during the first reaction stage, until said cellulose is partially etherified and converted to carboxymethylcellulose ether; and then, in a second reaction stage, adding additional alkali in one or more portions to the reaction mixture obtained from said first stage, without adding more of said etherifying agent, until said molar ratio of said alkali/said etherifying agent is at least 1.00 and completing the etherification reaction; and then recovering said alkali metal salt of carboxymethylcellulose ether from the reaction mixture.

4,426,519

7-(2-AMINO-4-THIAZOLYL)-ACETAMIDO CEPHALOSPORANIC ACIDS

Michel Vignau, Neuilly-sur-Seine, and Rene Heymes, Romainville, both of France, assignors to Roussel Uclaf, Paris, France

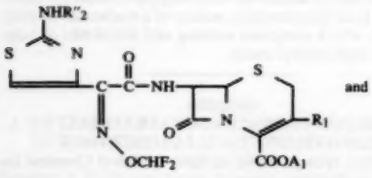
Division of Ser. No. 167,449, Jul. 10, 1980, Pat. No. 4,328,225. This application Jan. 27, 1982, Ser. No. 343,349

Claims priority, application France, Jul. 19, 1979, 79 18702

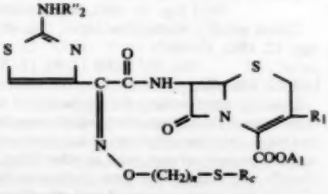
Int. Cl.[3] **C07D** *277/40, 501/56*

U.S. Cl. 544—27 **7 Claims**

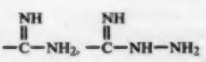
1. A compound having a formula selected from the group consisting of



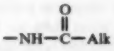
and



wherein R_2'' is an amine protective group, R_c is selected from the group consisting of

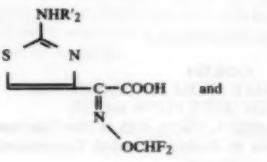


and CN, n is an integer from 1 to 4, R_1 is selected from the group consisting of hydrogen, chloro, methoxy, alkyl and alkylthio of 1 to 5 carbon atoms, cycloalkyl of 3 to 5 carbon atoms, azidomethyl, acetoxymethyl, carbamoyloxy-methyl,

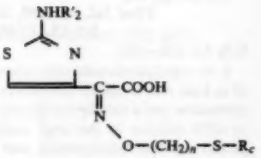


and $—CH_2—S—R'$, Alk is alkyl of 1 to 4 carbon atoms, R' is selected from the group consisting of an optionally substituted 1,2,3-thiadiazolyl, 1,2,5-thiadiazolyl, 1,2,4-thiadiazolyl, 1,3,4-thiadiazolyl, 1-H-tetrazolyl, 1,3-thiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1,3,4-triazolyl, 1,2,3-oxadiazolyl, 1,2,4-oxadiazolyl, 1,2,5-oxadiazolyl and 1,3,4-ozadiazolyl which heterocycle may be substituted with at least one member of the group consisting of methyl, ethyl, propyl, isopropyl, methoxy, ethoxy, propoxy, isopropoxy, amino, hydroxycarbonylmethyl, dimethylamino-ethyl and diethylaminoethyl and acyl of 2 to 4 carbon atoms and A_1 is selected from the group consisting of hydrogen and an easily cleavable ester.

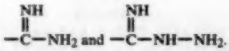
3. A compound having a formula selected from the group consisting of



and



wherein n is an integer from 1 to 4 and R_2' is selected from the group consisting of hydrogen and an amine protective group and R_c is selected from the group consisting of —CN,



4,426,520

3-CARBAMOYLOXY-CEPHAM-4-CARBOXYLIC ACID DERIVATIVES

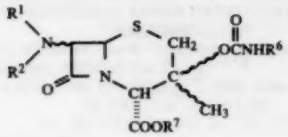
Robert L. Cundall, Liverpool, and Derek Walker, Jamesville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 893,092, Apr. 3, 1978, Pat. No. 4,322,347. This application Oct. 2, 1981, Ser. No. 307,907

Int. Cl.[3] **C07D** *501/20;* **A61K** *31/545*

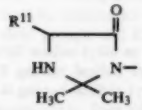
U.S. Cl. 544—30 **7 Claims**

1. A compound of the formula



in which

R^1 is hydrogen and R^2 is phenoxyacetyl, phenylacetyl, 2-amino-2-phenylacetyl 2-(p-hydroxyphenyl)acetyl, 2-amino-2-(p-hydroxyphenyl)acetyl, naphthoyl, 2-ethoxynaphthoyl, 5-methyl-3-phenyl-4-isoxazolylcarbonyl, 5-methyl-3-(o-chlorophenyl)-4-isoxazolylcarbonyl or 3-(2,6-dichlorophenyl)-5-methyl-4-isoxazolylcarbonyl, or R^1 and R^2, taken together with the nitrogen atom to which they are attached, form a phthalimido group, a succinimido group or a group of the formula



in which

R^{11} is phenyl or p-hydroxyphenyl;

R^6 is hydrogen, (lower)alkanoyl, chloroacetyl, dichloroacetyl, trichloroacetyl or p-toluenesulfonyl; and

R^7 is hydrogen or a conventional carboxyl-protecting group; or, when R^7 is hydrogen, a nontoxic pharmaceutically acceptable salt or physiologically hydrolyzable ester thereof.

4,426,521

CYANOGUANIDINE DERIVATIVES

Satoru Tanaka, Higashi-Kurume; Katsutoshi Shimada, Tokyo; Kazunori Hashimoto, Matsudo; Kiichi Ema, and Koichiro Ueda, both of Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

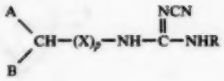
Division of Ser. No. 178,017, Aug. 13, 1980, Pat. No. 4,327,217, which is a division of Ser. No. 120,876, Feb. 12, 1980, Pat. No. 4,287,346. This application Jan. 28, 1982, Ser. No. 344,079

Claims priority, application Japan, Feb. 16, 1979, 54/15989; Feb. 16, 1979, 54/15990

Int. Cl.³ C07D *417/12*

U.S. Cl. 544—146 **1 Claim**

1. A compound of the formula:

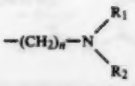


wherein

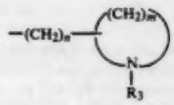
A represents (1) a substituted or unsubstituted phenyl, wherein the substituents are selected from the group of lower alkyl, lower alkenyl, halogen, lower alkoxy, lower alkylthio, lower alkylsulfonyl, and halogen substituted lower alkyl, (2) furyl, (3) thienyl or (4) cycloalkyl;

b represents phenyl;

R represents a group of the formula:



wherein R_1 and R_2 are the same or different, and each represents a lower alkyl group, or together with the nitrogen atom to which they are bonded form a member selected from the group consisting of pyrrolidine, piperidine, piperazine and morpholine, and n is an integer of 1–3, or R represents a group of the formula



wherein R_3 is a lower alkyl group, n is an integer of 1–3, and m is an integer of 4–5;

X represents an alkylene of 1 to 3 carbon atoms or an alkylene of 1 to 3 carbon atoms containing a terminal sulfur atom which is bonded to the nitrogen atom; and

p is 0 or 1, with the proviso that when A is unsubstituted phenyl, p is 0, or a pharmaceutically acceptable acid addition salt thereof.

4,426,522

HEXAHYDRO-1,2,4-TRIAZINE-3,5 DIONE DERIVATIVES

Chaim Simonovitch, Rishon L'etzion, Israel, assignor to ABIC Ltd., Israel

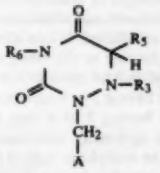
Filed Feb. 9, 1982, Ser. No. 347,355

Claims priority, application Israel, Feb. 18, 1981, 62151

Int. Cl.³ C07D *253/06*

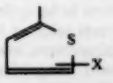
U.S. Cl. 544—182 **12 Claims**

1. A compound of the formula:

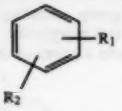


wherein R^3 is hydrogen, lower alkyl, tetrahydrofuryl, lower alkylsulfonyl or

wherein R_4 is lower alkyl, lower alkyl substituted by halogen, lower alkoxy or lower alkoxy carbonyl, or R_4 is phenyl substituted with at least one halogen, nitro or lower alkyl, or R_4 is benzyl substituted by at least one halogen, or R_4 is phenyl thio methylene or phenyl amino methylene substituted by at least one halogen, or R_4 is thienyl or thienyl substituted with at least one halogen atom or CO-hexahydro-1,2,4-triazine-3,5-dione, wherein R_5 is hydrogen or lower alkyl, wherein R_6 is hydrogen, lower alkyl, alkali metal or alkaline earth metal, and wherein A is



wherein X is at least one halogen, or A is



wherein R_1 and R_2 are each hydrogen, halogen, trifluoromethyl, lower alkyl, cyano or lower alkoxy, and wherein at least one of the substituents R_1, R_2, R_3, R_5 and R_6 must be other than hydrogen.

4,426,523

PREPARATION OF 1-AMINO-1,3,5-TRIAZINE-2,4(1H, 3H)-DIONES

Karlfried Dickore, Leverkusen, and Engelbert Kühle, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

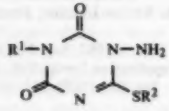
Filed Feb. 5, 1982, Ser. No. 346,341

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1981, 3106724

Int. Cl.³ C07D *251/38*

U.S. Cl. 544—223 **8 Claims**

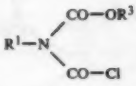
1. A process for the production of a 1-amino-1,3,5-triazine-2,4(1H, 3H)-dione of the formula



in which

R^1 represents a straight or branched alkyl radical which has 1 to 10 carbon atoms and which can be optionally substituted by lower alkoxy, lower alkylmercapto, halogen (particularly chlorine or fluorine), cyano and nitro; and also an alkenyl radical having 3 to 8 carbon atoms, an alkinyl radical having 3 to 8 carbon atoms and a cycloaliphatic radical having 5 to 8 ring carbon atoms, which radical can be optionally substituted by lower alkyl or lower alkoxy; an araliphatic radical having 7 to 12 carbon atoms, it being possible for the aromatic ring system to be optionally substituted by halogen, nitro, trihalogeno-lower alkyl (particularly trifluoromethyl), cyano, lower alkyl, lower alkoxy or lower alkylmercapto; an aromatic radical which has 6 to 12 carbon atoms and which can be optionally substituted by halogen, nitro, trihalogeno-lower alkyl (particularly trifluoromethyl), cyano, lower alkyl, lower alkoxy or lower alkylmercapto; or a heterocyclic radical having 5 or 6 ring atoms, it being possible for 1 to 3 hetero atoms (such as oxygen, sulphur and/or nitrogen) to be present in the ring system, and

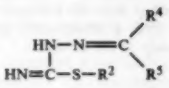
R^2 represents a straight or branched alkyl radical which has 1 to 6 carbon atoms and which can be optionally substituted by lower alkoxy, lower alkylmercapto, lower alkoxycarbonyl, halogen, cyano or nitro; an alkenyl radical having 3 to 6 carbon atoms; an alkinyl radical having 3 to 6 carbon atoms; a cycloaliphatic radical which has 5 to 8 ring carbon atoms and which can be optionally substituted by lower alkyl or lower alkoxy; or an araliphatic radical having 7 to 12 carbon atoms, it being possible for the aromatic ring system to be optionally substituted by one or more substitutents selected from lower alkyl, lower alkoxy, lower alkylmercapto, lower alkoxycarbonyl, halogen, cyano and nitro, comprising in a first stage reacting an N-substituted O-aryl N-chlorocarbonyl carbamate of the formula



in which

R^3 represents a phenyl radical which can be optionally substituted by lower alkyl, lower alkoxy, halogen, halogeno-lower alkyl (particularly trifluoromethyl), cyano and/or nitro, or a naphthyl radical,

with an isothiosemicarbazone of the formula



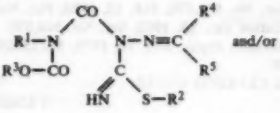
in which

R^4 represents a hydrogen atom or an alkyl radical having 1 to 3 carbon atoms, a cycloalkyl radical having 5 to 7 carbon atoms, or a benzyl or aryl radical having 6 to 10 carbon atoms, it being possible for each of the mentioned radicals to be substituted by halogen, cyano, nitro, lower alkyl, lower alkoxy or lower alkylmercapto, and

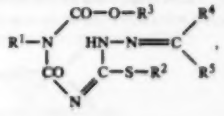
R^5 represents an alkyl having 1 to 3 carbon atoms, cycloalkyl having 5 to 7 carbon atoms, a benzyl or aryl radical having 6 to 10 carbon atoms, it being possible for each of the mentioned radicals to be substituted by halogen, cyano, nitro, lower alkyl, lower alkoxy or lower alkylmercapto, or

R^4 and R^5 together with the alkylidene C atom form a 5-membered to 7-membered carbocyclic ring. R^4 and R^5 particularly preferably represent methyl radicals,

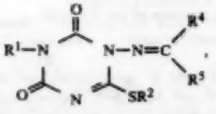
or a hydrohalide thereof, at a temperature between about 0° and 50° C. in the presence of an acid-binding agent, thereby to form open-chain intermediate products of the formula



and/or



then heating the intermediate products in a second stage to a temperature between about 50° and 150° C. thereby to form a 1-alkylidene-amino-1,3,5-triazine-2,4(1H, 3H)-dione of the formula



and in a third stage hydrolyzing the 1-alkylidene-amino-1,3,5-triazine-2,4(1H, 3H)-dione in an acid medium.

4,426,524

HETEROCYCLIC SUBSTITUTED BENZYL ALCOHOL, INSECTICIDAL ESTER DERIVATIVES, AND INTERMEDIATES

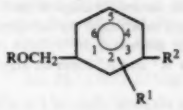
Ernest L. Plummer, North Tonawanda, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 183,550, Sep. 2, 1980. This application Jan. 21, 1982, Ser. No. 341,361

Int. Cl.³ C07D *241/00, 241/02, 211/70*

U.S. Cl. 544—336 3 Claims

1. A compound of the formula



wherein R^1 is hydrogen, halogen, lower alkyl, or trihalomethyl; R^2 is a thiophene, furan, pyrazine, or pyridine ring which may be substituted with one or more halogen atoms or lower alkyl groups; and R is hydrogen.

4,426,525

CERTAIN PHOSPHORIC ACID ESTER DERIVATIVES OF 1,3-DIOXY PROPANE

Motoo Hozumi, Omiya; Susumu Tsushima, Suita, and Yoshio Yoshioka, Nara, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

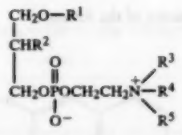
Filed Oct. 15, 1981, Ser. No. 311,876

Claims priority, application Japan, Oct. 22, 1980, 55-148485

Int. Cl.³ C07F *9/38, 9/58, 9/65*

U.S. Cl. 546—22 5 Claims

1. A compound of the formula



wherein

R^1 is tridecyl or tetradecyl,

R^2 is hydrogen or —OCH_3, and

is pyridinio, oxazolio or thiazolio

or a pharmaceutically acceptable salt thereof.

4,426,526

ALKOXYPYRIDYL ALKYLAMINES

Graham J. Durant; Charon R. Ganellin, both of Welwyn Garden City, and George S. Sach, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

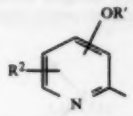
Division of Ser. No. 94,412, Nov. 15, 1979, Pat. No. 4,264,608, which is a division of Ser. No. 13,579, Feb. 21, 1979, Pat. No. 4,215,126, which is a division of Ser. No. 869,075, Jan. 13, 1978, Pat. No. 4,154,838, which is a division of Ser. No. 704,877, Jul. 13, 1976, Pat. No. 4,083,983. This application Nov. 19, 1980, Ser. No. 208,370

Claims priority, application United Kingdom, Jul. 31, 1975, 31970/75

Int. Cl.³ C07D *213/64, 213/65, 213/68*

U.S. Cl. 546—300 2 Claims

1. A compound of the formula Het—$CH_2Z(CH_2)_nNH_2$ where Het is a grouping of the formula:



where R' is lower alkyl; R^2 is hydrogen or lower alkyl Z is methylene and n is 2 or 3.

4,426,527

3-[5- OR 3-SUBSTITUTED-1,2,4-OXADIAZOL-3- OR -5-YL]-1-SUBSTITUTED-4-SUBSTITUTED-5-SUBSTITUTED OR UNSUBSTITUTED-2-IMIDAZOLIDINONES

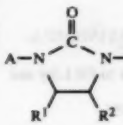
Jerome M. Lavanish, Akron, and Barry Van Gemert, Massillon, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 12, 1982, Ser. No. 348,479

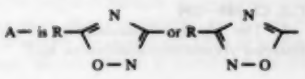
Int. Cl.³ C07D *413/04*

U.S. Cl. 548—133 3 Claims

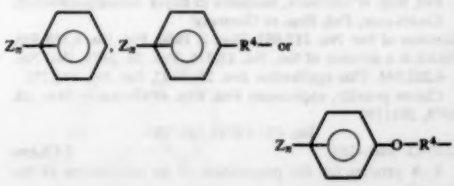
1. A compound represented by the formula:



wherein:

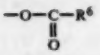


R is alkyl or haloalkyl of up to 6 carbon atoms, cycloalkyl of from 3 to 8 carbon atoms, alkenyl or alkynyl of up to 5 carbon atoms, —R^4—O—R^5 or R^4—S—R^5 wherein R^4 is alkylene of up to 6 carbon atoms and R^5 is alkyl of up to 6 carbon atoms,

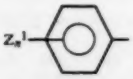


wherein Z is nitro, halogen, trifluoromethyl or R^5 and n is 0, 1, 2, or 3;

R^1 is hydroxy, halogen,



wherein R^6 is alkyl or haloalkyl of up to 6 carbon atoms, cycloalkyl of from 3 to 8 carbon atoms, alkenyl or alkynyl of up to 5 carbon atoms or



wherein Z^1 is nitro, halogen, trifluoromethyl, alkyl or alkoxy of up to 8 carbon atoms, and n is 0, 1, 2 or 3 or

wherein

R^7 and R^8 are the same or different and represent hydrogen, alkyl or haloalkyl of up to 6 carbon atoms; or R^7 can be

R^2 is hydrogen, hydroxy, alkyl, or haloalkyl of up to 4 carbon atoms or allyl; and

R^3 is alkyl of up to 3 carbon atoms or allyl.

4,426,528

PURIFICATION OF SYN-(2-AMINOTHIAZOL-4-YL)METHOXYIMINO)ACETIC ACID

Robert W. Burchfield, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 1, 1982, Ser. No. 364,356

Int. Cl.³ C07D *277/38*

U.S. Cl. 548—194 **2 Claims**

1. The bis-dimethylacetamide solvate of syn-(2-aminothiazol-4-yl)(methoxyimino)acetic acid.

4,426,529

PREPARATION OF 2-(2-2-DIMETHYL-3-BUTEN-1-YL)-2-OXAXOLINES

Manfred Jautelat, Burscheid, and Dieter Arlt, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

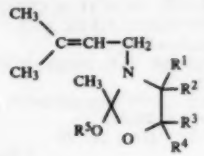
Division of Ser. No. 212,051, Dec. 1, 1980, Pat. No. 4,358,598, which is a division of Ser. No. 15,376, Feb. 26, 1979, Pat. No. 4,283,544. This application Jan. 25, 1982, Ser. No. 342,276

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811190

Int. Cl.³ C07D *263/10*

U.S. Cl. 548—216 **2 Claims**

1. A process for the preparation of an oxazolidine of the formula



in which

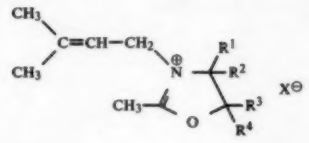
R^1, R^2, R^3 and R^4 each independently is hydrogen, alkyl with 1–4 carbon atoms, aralkyl with 7–9 carbon atoms, phenyl or phenyl substituted by halogen, alkoxy with 1–4 carbon atoms or phenoxy, or

R^1 and R^2 and/or R^3 and R^4 form an alkylene chain of 4–6 carbon atoms, or

R^1 and R^3 form an alkylene chain of 3 or 4 carbon atoms, and

R^5 is alkyl with 1–4 carbon atoms or phenyl,

comprising reacting a 2-methyl-3-(3-methyl-2-butenyl)-2-oxazolinium salt of the formula



in which

X is halogen, sulphonate or phosphate, with an alcoholate of the formula

in which

M is one equivalent of an alkali metal or alkaline earth metal cation.

4,426,530

TRIAZOLYLCOUMARIN COMPOUNDS, AND THEIR PREPARATION AND USE AS OPTICAL BRIGHTENERS, SCINTILLATORS AND LASER DYESTUFFS

Horst Berneth, Odenthal-Gloebusch, and Roderich Raue, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

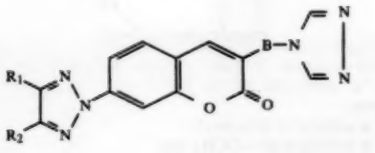
Filed Dec. 30, 1981, Ser. No. 335,987

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, 3101141

Int. Cl.³ C07D *406/14;* C09K *9/02, 11/06*

U.S. Cl. 548—256 **3 Claims**

1. Triazolylcoumarins of the formula



wherein

B denotes a direct bond or the 1,4-phenylene radical and

R_1 denotes C_1–C_4-alkyl,

R_2 denotes C_1–C_4-alkyl or phenyl which is optionally substituted by phenyl, CH_3, OCH_3 or Cl,

as well as derivatives thereof obtained from these compounds by treatment with dimethyl sulphate, diethyl sulphate, hydrochloric acid, optionally Cl-substituted or

CH_3-substituted benzenesulphonic acid, formic acid, acetic acid and lactic acid.

4,426,531

PROCESS FOR THE PREPARATION OF 1H-TETRAZOLE-1 COMPOUNDS USING TRIMETHYLSILYL AZIDE

Günter Bison, Troisdorf-Sieglar; Norbert Linkat, St. Augustin, and Wolfgang Wolfes, Niederkassel-Mondorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 102,080, Dec. 10, 1979, abandoned. This application Nov. 19, 1981, Ser. No. 323,013

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2854015

Int. Cl.³ C07D *257/04*

U.S. Cl. 548—253 **6 Claims**

1. A process for the preparation of 1H-tetrazole-1-acetic acid or its methyl or ethyl ester which comprises the steps of reacting trimethylsilyl azide with an orthocarboxylic acid ester of the formula

$$R_1C(OR)_3$$

wherein

R_1 is hydrogen or C_{1-8}alkyl,

R is lower alkyl

and glycine or a methyl or ethyl ester thereof, or methyl or ethyl ester hydrochloride.

4,426,532

α-(3-CYANO-PROPANOYL)-AMINOCARBOXYLIC ACID DERIVATIVES

Axel Kleemann, Hanau; Jurgen Martens, Alzenau, and Horst Weigel, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

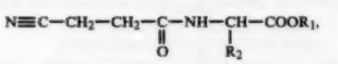
Filed May 25, 1982, Ser. No. 381,876

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1982, 3124091

Int. Cl.³ C07D *233/64*; C07C *121/52*

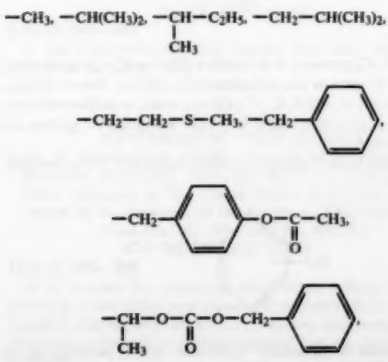
U.S. Cl. 548—344 **10 Claims**

1. An Nα-(3-cyanopropanoyl)-aminocarboxylic acid derivative of the formula



(II)

where R_1 is hydrogen, methyl, ethyl, or benzyl and R_2 is hydrogen or



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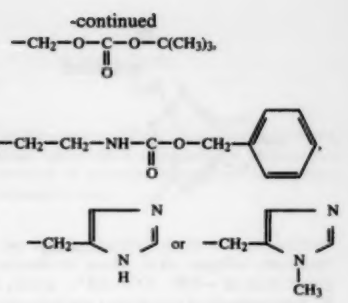


4,426,533

PROCESS FOR PRODUCING BISMETHINE ISOINDOLINES

Alain C. Rochat, Basel, and Luigi Cassar, Kaiseraugst, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

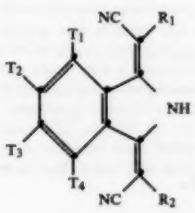
Filed Mar. 29, 1982, Ser. No. 362,580

Claims priority, application Switzerland, Apr. 6, 1981, 2328/81

Int. Cl.³ C09B *57/04*

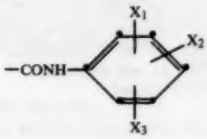
U.S. Cl. 548—471 **11 Claims**

1. A process for producing bismethine isoindolines of the formula

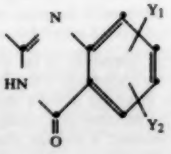


(I)

wherein T_1 to T_4 are hydrogen or halogen, or one or two of the radicals T_1 to T_4 are alkyl, alkoxy or phenoxy, and R_1 and R_2 independently of one another are each cyano, alkyl- or arylcarbonyloxy, carbamoyl, alkylcarbamoyl, or radicals of the formulae II to IV



(II)



(III)

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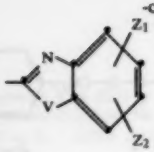
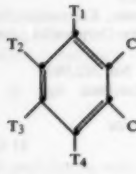
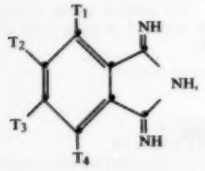


(IV)

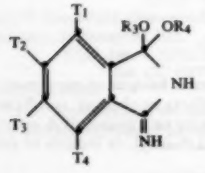
wherein X_1 is a non-solubilising group, and X_2 and X_3 are hydrogen, halogen, alkyl, alkoxy or alkoxycarbonyl, or together form an —NR'—CO—NR"— group, in which R' and R" independently of one another are hydrogen or C_1–C_4-alkyl, and Y_1 and Y_2 are hydrogen, halogen, alkyl or alkoxy, or together form a fused-on benzene ring, V is oxygen, sulfur, imino or alkylimino having 1 to 4 C atoms, and Z_1 and Z_2 have the meanings of Y_1 and Y_2, in which process the condensation of 1 mol of a compound of the formula V, VI or VII or of the salts of VI or VII



(V)

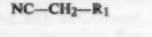


(VI)



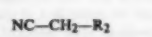
(VII)

wherein T_1 to T_4 have the meanings defined above, and R_3 and R_4 are identical or different and are C_1–C_4-alkyl, or together form the group —CH_2—CH_2—, with 2 mols of a cyanomethylene compound of the formula



(VIII)

or



(IX),

or with 1 mol of a cyanomethylene compound of the formula VIII and 1 mol of a cyanomethylene compound of the formula IX, wherein R_1 and R_2 have the meanings defined above, is performed in a polar solvent in the presence of a strong base, and the bismethine isoindoline obtained is isolated from the reaction mixture by hydrolysis in the presence of an acid.

4,426,534
METHOD FOR PRODUCING ALDEHYDES AND KETONES USING 2,2'-BIPYRIDINIUM CHLOROCHROMATE AS OXIDIZING AGENT

Frank S. Guziec, Jr., Las Cruces, N. Mex., assignor to Thiokol Corporation, Chicago, Ill.

Division of Ser. No. 304,456, Sep. 22, 1981, Pat. No. 4,399,281.
This application Jul. 26, 1982, Ser. No. 401,453
Int. Cl.³ C07D *333/24*
U.S. Cl. 549—70 1 Claim

1. In a method of converting a primary or secondary alcohol to its corresponding aldehyde or ketone respectively, the improvement comprising reacting said alcohol and 2,2'-bipyridinium chlorochromate.

4,426,535
METHOD OF SYNTHESIZING BREVICOMIN AND USING SAME IN BEETLE CONTROL

Theodore Cohen, Pittsburgh, Pa., and James Matz, Ithaca, N.Y., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Oct. 20, 1981, Ser. No. 312,988
Int. Cl.³ C07D *311/00*
U.S. Cl. 549—397 12 Claims

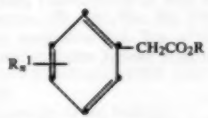
1. A method of synthesizing brevicomin comprising:
providing a reactive metal reducing agent in solution form,
selecting said reactive metal from the group consisting of alkali metals and alkaline earth metals,
admixing with said reducing agent in alpha-(phenylthio) ether substrate which is the Diels-Alder adduct of phenyl vinyl sulfide and methyl vinyl ketone,
effecting said admixture at about −45° C. to about −93° C., for at least about 15 minutes, adding to said reducing agent-substrate solution about 1 to 10 moles of propionaldehyde, adding an organic solvent, and washing the reaction mixture with an aqueous acid solution.

4,426,536
SYNTHESIS OF PHENYLACETIC ACID ESTERS

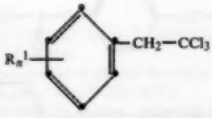
Roger L. Robey, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 14, 1982, Ser. No. 387,910
Int. Cl.³ C07L *69/76*
U.S. Cl. 560—105 14 Claims

1. A process for preparing a phenylacetate of the formula



wherein
R is C_1–C_6 primary or secondary alkyl or C_3–C_6 cycloalkyl;
the R^1 groups are independently chloro, fluoro, bromo, iodo, C_1–C_3 alkyl, C_1–C_3 alkoxy, nitro, or trifluoromethyl;
n is 0–3, provided that n is 3 only when the R^1 groups are chloro or bromo;
comprising hydrolysing a trichloro compound of the formula



with sodium or potassium hydroxide in the presence of an alcohol of the formula ROH.

4,426,537

PREPARATION OF CARBOXYLIC ACIDS BY CARBONYLATION OF ALCOHOLS

Jean Gauthier-Lafaye, Lyons, and Robert Perron, Charly, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 5, 1981, Ser. No. 260,811
Claims priority, application France, May 6, 1980, 80 10541
Int. Cl.³ C07C 51/12
U.S. Cl. 562—519 21 Claims

1. A process for the preparation of a carboxylic acid having the structural formula R^1COOH, wherein R^1 is a linear, branched or cyclic chain alkyl radical of from 1 to 6 carbon atoms or a phenyl-C_nH_{2n}-radical wherein $1 \leqq n \leqq 6$, comprising carbonylating an alcohol having the formula R^1-OH with carbon monoxide in liquid phase, in the presence of a catalytically effective amount of nickel and an alkyl or acyl halide promoter therefor, at a temperature of at least 120° C. and under a total pressure of less than 200 bars, said carbonylation being carried out in the presence of at least one lanthanide salt, and in an initial carboxylic acid reaction medium having the formula R^2-COOH, wherein R^2 is defined as was R^1 above, and further wherein R^1 and R^2 may be the same or different.

4,426,538

PROCESS FOR THE PREPARATION OF OPTIONALLY P-CHLORINE-SUBSTITUTED 2,6-DIAMINOTOLUENE

Klaus-Peter Heise, Bergisch-Gladbach; Ernst Schneider, and Karlfried Wedemeyer, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 21, 1982, Ser. No. 341,375
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1981, 3104643
Int. Cl.³ C07C 85/11
U.S. Cl. 564—417 25 Claims

1. A process for the preparation of 2,6-diaminotoluene, which comprises dinitrating 3,4-dichlorotoluene with 2–4 mols of dinitrating agent per mol of 3,4-dichlorotoluene in the presence of an inert, water immiscible organic solvent at a temperature of (−10° to +100° C.) 0°–40° C. and thereafter reducing the so-nitrated compound in the presence of an inert organic solvent and splitting off the chlorine atom whereby to form 2,6-diaminotoluene.

4,426,539

SYNTHESIS OF THE ISOMERIC AMINOTETRANITROTOLUENES

Ronald L. Atkins; William P. Norris; Arnold T. Nielsen; Richard A. Hollins, and William S. Wilson, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1982, Ser. No. 377,119
Int. Cl.³ C07C 43/20
U.S. Cl. 564—441 7 Claims

1. Aminopolynitrotoluenes having four nitro radicals attached to the carbon ring.

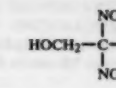
4,426,540

SYNTHESIS OF VINYL ETHERS

Scott A. Shackelford, USAF Academy, Colo.; Raymond R. McGuire, Brentwood, Calif., and Robert E. Cochoy, Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 10, 1976, Ser. No. 694,261
Int. Cl.³ C07C 43/00
U.S. Cl. 568—590 8 Claims

1. A process for preparing vinyl ethers which comprises reacting, under reflux conditions and atmospheric pressure for a period ranging from about 6 to 72 hours, equimolar amounts of divinyl ether and a primary alcohol having the following formula:



wherein X is fluorine, nitro or $(CH_2)_nCH_3$ and n is zero, 1 or 2, the reaction being conducted in a chlorinated hydrocarbon solvent in the presence of a catalytic amount of red mercuric oxide and trifluoroacetic acid.

4,426,541

PROCESS FOR PRODUCTION OF ALIPHATIC ALCOHOLS

Terry S. King, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 16, 1982, Ser. No. 358,644
Int. Cl.³ C07C 29/14
U.S. Cl. 568—881 8 Claims

1. An improved process for hydrogenating oxo aldehydes to the corresponding oxo alcohols in the presence of organo-sulfur impurities which comprises:

(a) contacting an aldehyde feed containing organo-sulfur compound impurities in a first reaction zone at a temperature within the range of from about 180° to 260° C. in the presence of a sulfided hydrogenation catalyst and in the presence of gaseous hydrogen to hydrogenate at least a portion of said aldehydes to said alcohols, thereby forming a partially hydrogenated effluent consisting of organo-sulfur compound impurities, product alcohol and unreacted aldehyde; and

(b) directly introducing said partially hydrogenated effluent, after optionally performing one or more of the steps of (i) cooling said effluent and (ii) degassing said effluent to remove excess hydrogen, to a second hydrogenation zone wherein at least a portion of the unreacted aldehydes are hydrogenated in the presence of a metallic nickel catalyst comprising nickel on alumina and in thepresence of from about 175° to 250° C., said temperature in said second hydrogenation zone being lower than the temperature employed in said first hydrogenation zone.

4,426,542

SYNTHESIS OF PLASTICIZER AND DETERGENT ALCOHOLS

George E. Barker, and Denis Forster, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 256,439, Apr. 22, 1981, which is a continuation of Ser. No. 104,517, Dec. 17, 1979. This application Jun. 11, 1981, Ser. No. 272,587
Int. Cl.³ C07C 29/14
U.S. Cl. 568—883 23 Claims

1. A process of preparing alcohols which comprises conducting an oxo reaction with hydrogen, carbon monoxide and olefins selected from those having 3 to 7 carbon atoms to obtain aldehydes having from 4 to 8 carbon atoms and comprised of a mixture of isomer containing at least 50% alkanals with no branching at the 2-position and subjecting the aldehydes to an aldol reaction to cause good conversion of the aldehydes to aldol product but with that produced from cross-aldol of 2-substituted aldehydes constituting no more than 20% of the product, and hydrogenating to obtain alcohols.

4,426,543

VAPOR PHASE NITRATION OF AROMATIC HYDROCARBONS

Ignatius Schumacher, Ballwin, and Kang-Bo Wang, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 210,423, Nov. 26, 1980, abandoned. This application Feb. 17, 1982, Ser. No. 349,487

Int. Cl.³ C07C *79/10*

U.S. Cl. 568—940 **15 Claims**

1. A process for the vapor phase nitration of aromatic hydrocarbons selected from the group consisting of benzene and toluene which process comprises contacting the aromatic hydrocarbon with a nitrating agent in the vapor phase in the presence of a molecular sieve catalyst at a temperature between about 80° C. and about 190° C.

4,426,544

POWER RECOVERY IN MOTOR FUEL ALKYLATION PROCESS

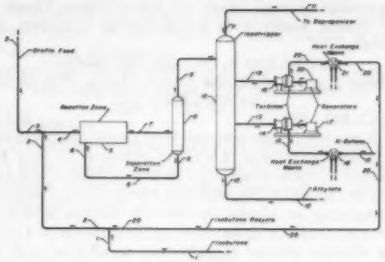
Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 1, 1982, Ser. No. 394,376

Int. Cl.³ C07C *2/56*

U.S. Cl. 585—709 **12 Claims**

1. In a process for the alkylation of light hydrocarbons having less than six carbon atoms per molecule wherein the light hydrocarbons and an acyclic olefinic hydrocarbon are contacted in the presence of a liquid-phase acid catalyst in a reaction zone, hydrocarbons removed from the reaction zone are separated in a fractionation column operated at a superatmospheric pressure, and a vapor-phase sidecut stream is withdrawn from the fractionation column and subsequently condensed; the improvement which comprises depressurizing the sidecut stream in a power recovery turbine to generate useful



energy and then condensing the sidecut stream before recycle of at least a portion thereof to said alkylation reaction zone.

4,426,545

ADAMANTYL CARBOXYLIC AND SULFONIC ACID CATALYZED PARAFFIN-OLEFIN ALKYLATION

George M. Kramer, Berkeley Heights, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Mar. 15, 1983, Ser. No. 475,450

Int. Cl.³ C07C *3/12, 3/14, 3/18*

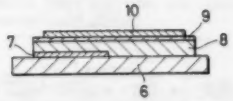
U.S. Cl. 585—724 **25 Claims**

1. An alkylation process comprising the step of contacting a C_4–C_6 paraffinic compound, capable of forming a carbonium ion under strong acid conditions, with a C_2–C_5 olefin in the presence of a strong acid system and an adamantyl carboxylic acid, adamantyl sulfonic acid, or mixture thereof, said adamantyl compound containing at least one unsubstituted bridgehead position, and said process being conducted at a temperature of about −100° to 150° C., thereby producing a C_6–C_{11} branched paraffinic hydrocarbon.

4,426,546
FUNCTIONAL ELECTRIC DEVICES

Shu Hotta, Hirakata; Tomiharu Hosaka, Yawata; Wataru Shimotsuma, Ibaraki, and Yoshio Kishimoto, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Dec. 11, 1981, Ser. No. 329,879
Claims priority, application Japan, Dec. 12, 1980, 55-176327
Int. Cl.³ H01L 31/04; H01C 7/00
U.S. Cl. 136—256 25 Claims



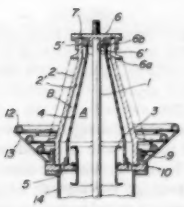
1. A functional electric device comprising a functional material layer, and a pair of electrodes which are separated from each other and electrically contact said functional material layer, at least one of said pair of electrodes being made of copper or an alloy of copper, a copper inactivating agent being present between said functional material layer and said at least one electrode.

18. The functional electric device according to claim 1, further comprising an optically transparent substrate on which one of said pair of electrodes, said functional material layer made of a thin film of a photosensitive material capable of developing an electromotive force when exposed to light, and another electrode made of copper or an alloy of copper are formed in this order, said copper inactivating agent being present between said functional material layer and said other electrode as a layer.

4,426,547
GAS-FILLED INSULATING BUSHING HAVING CHAMBERS SEPARATED BY AN INSULATING PARTITION

Toyohisa Ogino, Okazaki, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Jun. 24, 1981, Ser. No. 277,004
Claims priority, application Japan, Jul. 3, 1980, 55-92844
Int. Cl.³ H01B 17/26, 17/36
U.S. Cl. 174—31 R 4 Claims

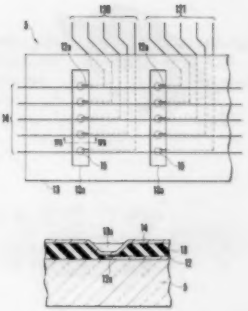


1. A gas-filled insulating bushing including a center conductor and including a porcelain tube enclosing therein a pressurized insulating gas, said bushing comprising a tubular electrical insulating partition, of such thickness that it can only withstand the full internal gas pressure of said pressurized gas in said insulating bushing in the absence of said porcelain tube for approximately 1/10 of one second, surrounding said center conductor and dividing the gas space in said porcelain tube into two spaces, one between said porcelain tube and said partition and the other between said partition and said center conductor, said partition being located adjacent to an inner wall of said porcelain tube, and said spaces being communicated with each other through small diameter vents, said vents being so small as to inhibit but not prevent entirely flow of said pressurized gas therethrough, so that the gas pressure in the space between said partition and said center conductor is supplied to the space between said partition and said porcelain tube through said small diameter vents to equalize the pressure in both said spaces, whereby when said porcelain tube is broken the gas pressure in the space between said partition and said porcelain tube opens into the air and simultaneously falls to a lower pressure and scattering of fragments of said broken porcelain tube is thus minimized.

4,426,548
MULTILAYER WIRING STRUCTURE

Ryoji Oritsuki; Tohru Watanabe; Kazuo Shirahashi, all of Mobara; Hiromi Kanai, and Kozo Odawara, both of Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1982, Ser. No. 346,921
Claims priority, application Japan, Feb. 13, 1981, 56-19107
Int. Cl.³ H05K 1/14, 1/16; H01R 4/02
U.S. Cl. 174—72 R 5 Claims



1. In a multilayer wiring structure comprising an upper pattern and a lower pattern formed on opposite sides of an intervening insulation film each of said patterns having a multiplicity of wirings, the improvement wherein the intervening insulation film is formed with a void exposed to both said upper pattern of a multiplicity of wirings and said lower pattern of a multiplicity of wirings, said upper and lower patterns being arranged to form a matrix, the void extends longitudinally across one of said patterns at right angles with respect to the wirings of said pattern, and said upper and lower patterns are connected together through the void at crossing points of the matrix.

4,426,549
TRACK AND EROSION RESISTANT ELECTRICAL INSULATION COMPRISING ZINC BORATE AND ETHYLENE POLYMER

Gary S. Natwig, Wilmington, Mass., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Continuation of Ser. No. 226,138, Jan. 19, 1981, abandoned. This application Jul. 9, 1982, Ser. No. 396,755
Int. Cl.³ H01B 3/44, 17/62
U.S. Cl. 174—110 PM 6 Claims

1. Electrical apparatus comprising at least two spaced electrically conducting members between which electrical potentials may be developed, an organic insulating material disposed between said members and having an outer surface intermediate said members exposed to ambient contaminating atmospheric conditions, said surface material comprising a polymer or copolymer of ethylene which tends to form low resistance conducting paths under the influence of creepage type electrical discharges occurring under contaminating conditions and means for preventing the formation of said conducting paths

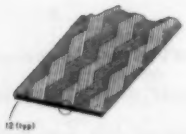
due to creepage, said means comprising hydrated zinc borate dispersed in said surface material in an amount sufficient to increase the average breakdown voltage occurring during the course of the test procedure according to ASTM D2303 above the average breakdown voltage in the absence of said hydrated zinc borate.

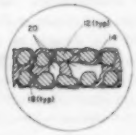
4,426,550

MULTIWIRE CONDUCTOR HAVING GREATLY INCREASED INTERWIRE RESISTANCE AND METHOD FOR MAKING SAME

Thomas Luhman, Seattle, Wash., and Masaki Suenaga, Bellport, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 15, 1982, Ser. No. 358,085
Int. Cl.³ H01B *7/08, 12/00*
U.S. Cl. 174—128 R **10 Claims**





1. A method for increasing the interwire resistance of a multi-wire conductor containing substantial copper of the type which is mechanically stabilized by a tin based solder filler, comprising the steps of:

(a) heating said conductor to a uniform temperature above the melting point of the solder;

(b) maintaining said temperature for a time sufficient for a substantial amount of copper to dissolve into the solder forming the brittle intermetallic compound Cu_5Sn_6;

(c) cooling the conductor to room temperature; and

(d) flexing the conductor so that a random network of cracks forms in the solder.

4,426,551

SPEECH RECOGNITION METHOD AND DEVICE

Akio Komatsu, Hachiouji; Akira Ichikawa, Musashino; Nobuo Hatsoka, Hachiouji; Yoshiaki Kitazume, Sayama, and Kazuhiro Umemura, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

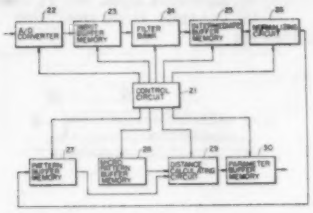
Filed Nov. 19, 1980, Ser. No. 208,251
Claims priority, application Japan, Nov. 19, 1979, 54-148904
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—41 **7 Claims**

1. A method of recognizing speech comprising the following steps:

a first step of calculating P (P: a positive integer of 2 or more) first characteristic parameters from an input speech at respective points in time;

a second step of performing a comparative operation between said first characteristic parameters calculated at said first step and P first characteristic parameters of n (n: a positive integer of 1 or more, where P>n) specific speech patterns which have a high separability, at respective points in time to obtain n second characteristic parameters, each representing the distance or correlation between the first characteristic parameters of the input speech signal and each of the specific speech patterns; and

a third step of detecting coincidence between said second



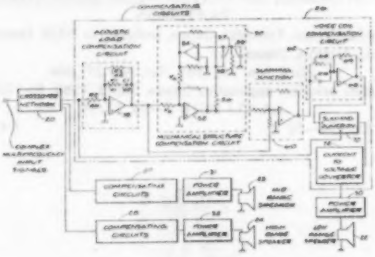
characteristic parameters obtained at said second step and n second characteristic parameters obtained in advance by the comparison between P first characteristic parameters of a standard speech and said first characteristic parameters of said specific speech patterns, thereby effecting the recognition of the input speech.

4,426,552

SPEAKER DISTORTION COMPENSATOR

Kenneth W. Cowans, 17520 Greenleaf St., Encino, Calif. 91316, and M. Owen Bennett, 5713 Rainbow Hill Rd., Agoura, Calif. 91301

Division of Ser. No. 93,839, Nov. 13, 1979, Pat. No. 4,340,778.
This application Jul. 13, 1982, Ser. No. 397,687
Int. Cl.³ H04R *3/00*
U.S. Cl. 381—71 **18 Claims**



1. The method of reproducing sound originally emanating from an extended source with a transducer appearing as a simple source and having a transverse dimension substantially smaller than the average wavelength being generated in a complex multi-frequency sound sequence, comprising the steps of:

processing signals representing the complex multi-frequency sound sequence that is desired;

modifying signals in accordance with a model of at least some of the mechanical characteristics of the transducer to anticipate spurious emanations of pressure waves, the modified signal compensating the signals in accordance with an inverse analog of at least the mass, damping and compliance of the transducer, the acoustic reactance of a ported enclosure, the inherent electrical reactance characteristics of the transducer and the acoustic load on the transducer, to suppress spurious emanations in the normal operating range of the transducer; and

driving the transducer with the compensated signal, whereby spurious emanations are counteracted and spuri-

ous emanations are shifted to a region at which they are inaudible for the transducer.

3. The method of generating complex multi-frequency sound pressure waves with different frequency range transducers while minimizing spurious simple source emanations from the transducers comprising the steps of:

driving a higher frequency transducer with high frequency band signals providing a spurious emanation in the frequency overlap region with the next lower frequency band; and

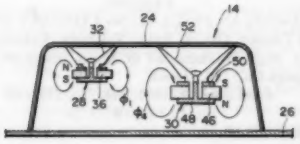
introducing a compensating, opposed phase spurious emanation component while driving the transducer for the next lower frequency band such that the opposed spurious emanations acoustically cancel.

4,426,553

VEHICLE LOUDSPEAKER ARRANGEMENT WITH MAGNETIC-FIELD-SENSITIVE DEVICE

Tetsuo Senoo, Inagi, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 15, 1982, Ser. No. 398,657
Claims priority, application Japan, Jul. 31, 1981, 56-119237
Int. Cl.³ H04R 9/06
U.S. Cl. 179—117 **5 Claims**



1. A loudspeaker arrangement for a vehicle having a magnetic-field-sensitive device, comprising:

(a) a casing;

(b) first and second loudspeakers disposed in the casing; and

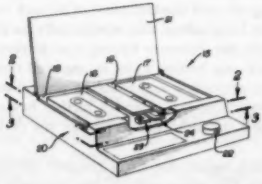
(c) first and second magnets incorporated in the first and second loudspeakers respectively, the respective magnetic moments of the first and second magnets being antiparallel so that the vector sum of magnetic fluxes produced by the first and second magnets will be reduced at the position of the magnetic-field-sensitive device.

4,426,554

TAPE DRIVE TRANSFER SYSTEM FOR CASSETTE TELEPHONE ANSWERING DEVICE WITH REMOTE CONTROLLED PLAYOUT

Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406

Filed Jan. 29, 1982, Ser. No. 343,728
Int. Cl.³ H04M 1/64
U.S. Cl. 179—6.07 **8 Claims**



1. In a telephone answering device in which incoming messages recorded on a magnetic tape cassette can be played out under remote control, said device having at least one cassette drive motor, the improvement comprising:

spindle drive assembly means having forward and rewind operating positions for respectively alternately motor driving either the take-up spindle or the source spindle of said cassette, and

a tape drive transfer system having;

a transfer lever connected to said drive assembly means and biased to a first position in which said drive assembly means is in said forward operating position, and

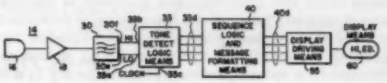
solenoid means, actuated in response to receipt of a remote playout control signal and linked to said transfer lever, for offsetting said transfer lever into driven relationship with one cassette drive motor, said one cassette drive motor thereafter driving said transfer lever from said first position to a second position in which said drive assembly means is in said rewind operating position.

4,426,555

TELEPHONE COMMUNICATIONS DEVICE FOR HEARING-IMPAIRED PERSON

Edwin C. Underkoffler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 18, 1982, Ser. No. 340,575
Int. Cl.³ H04M 11/00
U.S. Cl. 179—84 L **11 Claims**



1. A device, required only at a receiving location, for visually presenting information communicated over a telephone connection as a sequence of dual-tone-matrix-frequency (DTMF) signals to a receiving telephone instrument at said receiving location, comprising:

transducer means receiving the DTMF audio tones from said receiving telephone instrument for converting said audio tones into electrical signals;

means for filtering each dual-tone electrical signal into concurrent high-frequency-group and low-frequency-group electrical tone signals;

decoding means for converting each combination of one of the high-frequency-group tone signals and one of the low-frequency-group tone signals to an associated digital signal;

microprocessor means, including means for storing a set of instructions and for providing at least one randomly-accessible storage register, for recognizing the digital signal as at least a portion of one of a set of display control and alphanumeric symbols with each set symbol being completely characterized by no more than two successively-received digital signals, for storing the alphanumeric symbol in said register, for modifying the sequence and presence of the alphanumeric symbols stored in said register responsive to said display control symbols and for outputting a plurality of sequential alphanumeric symbols, including at least the last-received alphanumeric symbol, upon recognition of the at lest one digital signal corresponding to said last-received symbol; and

means receiving the microprocessor means symbol output for simultaneously displaying the plurality of sequential alphanumeric symbols successively including at least said last-received alphanumeric symbol as soon as recognized by the microprocessor means.

4,426,556
ELECTRODYNAMIC LOUDSPEAKER

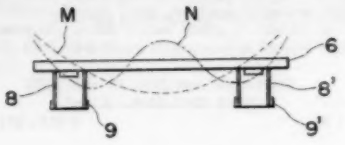
Shuji Saiki, Hirakata; Katuaki Sato, Osaka; Kazue Sato; Seiichi Ishikawa, both of Kadoma; Hideaki Inoue, Neyagawa, and Tsuneo Tanaka, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 7, 1981, Ser. No. 281,167

Claims priority, application Japan, Jul. 8, 1980, 55-93646; Oct. 8, 1980, 55-141691; Feb. 19, 1981, 56-24114

Int. Cl.³ H04R *9/00, 9/06*

U.S. Cl. 179—115.5 DV **19 Claims**



1. An electrodynamic loudspeaker having:

a generally rectangular flat vibrating plate having two pairs of opposite sides, the sides of one of said pairs being longer than the sides of the other said pair; and

magnetic drive means consisting only of first and second magnetic drives for driving the vibrating plate to produce vibrations, said first magnetic drive being so positioned as to drive the vibrating plate at a first location corresponding to one of two line nodes m_1 and m_2 of vibration of a first predetermined frequency f_1 which would be produced when the vibrating plate is driven at the center thereof, said second magnetic drive being so positioned as to drive the vibrating plate at a second location corresponding to one of four line nodes n_1, n_2, n_3 and n_4 of vibration of a second predetermined frequency f_3 which would be produced when the vibrating plate is driven at the center thereof, each of all of said line nodes extending in parallel to the shorter sides of the rectangular shape of the vibrating plate.

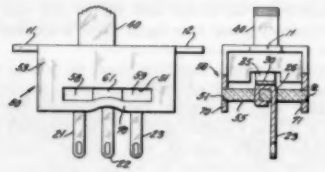
4,426,557
SWITCH HOUSING STRUCTURE FOR CONNECTION TO SWITCH TERMINAL BOARD

Thomas J. Quigley, Newtown, Pa., assignor to Continental-Wirt Electronics Corp., Southampton, Pa.

Filed Jan. 18, 1982, Ser. No. 340,353

Int. Cl.³ H01H *15/02*

U.S. Cl. 200—16 D **3 Claims**



1. A switch assembly comprising a thin, flat, rectangular switch terminal board of insulation material; a plurality of stationary contacts fixed to one surface of said switch terminal board; a U-shaped housing of thin, rigid material having first and second flat legs and a bridging base member and mounting means for mounting said switch on a mounting surface; a movable contact assembly disposed atop said plurality of stationary contacts and within said housing and movable in sliding relationship with respect to said plurality of stationary contacts; an operating member fixed to said movable contact assembly and having a handle portion extending through said bridging base member and accessible for operation from regions external of said U-shaped housing; said first and second flat legs of said housing having respective first and second parallel elongated slots extending therethrough which are parallel to and adjacent the respective free ends of said flat legs; said flat switch terminal board having first and second parallel edges which are disposed in said first and second slots respectively; said first and second edges terminating generally flush with the outer surfaces of said first and second flat legs respectively; said switch terminal board holding said movable contact assembly and said operating handle in place within said U-shaped housing and resisting forces produced by said movable contact assembly and said operating member; said first and second edges of said switch terminal board having respective central notches; the material in the webs between said free ends of said first and second legs and said first and second slots respectively being deformed into said central notches of said first and second legs respectively.

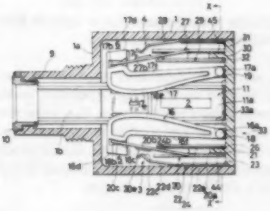
4,426,558
JACK HAVING AN INSULATING CONTACT OPERATOR

Masanori Tanaka, Osaka; Yukio Takihara, Kaizuka, and Toru Masuda, Higashi-Osaka, all of Japan, assignors to Hosiden Electronics Co., Ltd., Japan

Filed Jun. 11, 1981, Ser. No. 272,978

Int. Cl.³ H01R *33/54*

U.S. Cl. 200—51.09 **7 Claims**



1. A jack having a jack case with an electrical contact switch adapted to be operated responsive to insertion and removal of at plug, having a conductor portion, into and from the jack case, along an insertion axis, the jack comprising:

a jack contact piece adapted to be engaged by the conductor portion of the plug and to remain in contact therewith until plug removal;

an insulating separator, having a receiving surface for supporting the jack contact piece at its back surface, disposed with its longitudinal axis substantially parallel to the insertion axis, the separator having a projection at one end and the jack case having a slot in one wall thereof for receiving the projection and enabling pivotal movement about the projection, the separator further having a stopper for engaging the jack case to restrict the pivotal movement; and,

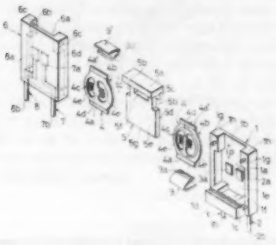
the contact switch having a resilient contact piece which engages the other end of the separator and resiliently positions the separator within the housing, such that upon plug insertion, the plug will indirectly engage an intermediate portion of the separator through the jack contact piece, and thereby pivot the separator, the separator engaging and pivoting the resilient contact piece to operate the electrical contact switch.

4,426,559

PUSH BUTTON SWITCH HAVING TWO RESILIENT CONTACTS OPERATED AT DIFFERENT TIMES

Shiro Kondo, Furukawa, and Ken Mizuta, Miyagi, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 333,731
Claims priority, application Japan, Dec. 24, 1980, 55-185811
Int. Cl.³ H01H *21/40*
U.S. Cl. 200—67 DB 5 Claims



1. A push button switch comprising first and second switch portions mounted in a case; each of said switch portions including a respective movable contact piece formed of a resilient metal plate having a central portion adapted to change its position suddenly upon application of a pressing force applied therealong, a respective movable contact portion carried by each said central portion, arms formed to hold the central portion therebetween, a respective auxiliary spring engaged with one of said arms of each contact piece and a fixed contact portion formed at respective positions in said case confronting the respective movable contact portions, and means including a single slider movable slidably within said case and adapted to apply pressing forces along each said movable contact piece with the pressing force necessary to change the position of a switch portion comprised by one movable contact piece and auxiliary spring being different from the pressing force necessary to change the position of the other switch portion comprised by the other movable contact and the other auxiliary spring.

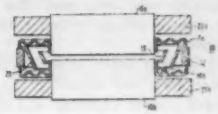
4,426,560

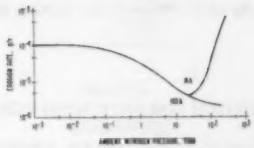
REDUCED PRESSURE ELECTRICAL SWITCH

Clive W. Kimblin, Churchill Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1980, Ser. No. 206,502
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B 5 Claims

1. In an electrical switch module for low voltage d.c., high continuous current operation and interruption, adapted for shunting an electrolytic cell, which electrical switch module is hermetically sealed and comprises an annular insulating envelope portion, annular flexible corrugated diaphragm members extending transversely inwardly from the annular insulating envelope portion to cylindrical conductive contact members, the improvement wherein the hermetically sealed switch module has a reduced pressure atmosphere which is maintained at from about 10^{-1} to 10^{2} Torr.



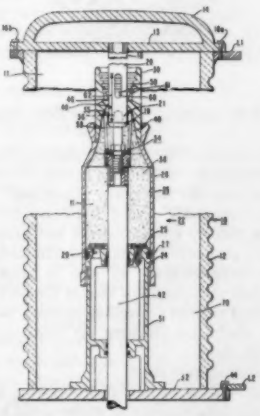


4,426,561

PUFFER-TYPE COMPRESSED-GAS CIRCUIT-INTERRUPTER

Lee E. Berkebile, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 19, 1982, Ser. No. 340,594
Int. Cl.³ H01N *33/88*
U.S. Cl. 200—148 A 7 Claims



1. A puffer-type gas-insulated circuit interrupter comprising:
a hollow casing having an insulating gas disposed therein;
a hollow, tubular stationary contact having an inside diameter disposed within said casing, said stationary contact having an end thereof distal from said casing, said stationary contact having radial venting aperture means disposed therein at least a portion of which are disposed along said stationary contact within a region between the end of said stationary contact and a location up to three times said stationary contact inside diameter from said stationary contact end;
a movable contact structure cooperable with said stationary contact disposed within said casing and separable from said stationary contact to establish an arc therebetween during an opening operation;

gas compression means disposed in said casing for generating a blast of compressed gas during an opening operation, said gas compression means comprising a piston and a cylinder movable relative to each other to compress gas within the interior of said cylinder during an opening operation; and

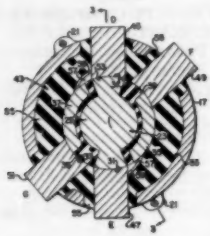
a hollowing elongated nozzle affixed to said cylinder and movable therewith, said nozzle in the interior thereof having a neck portion engaging said stationary contact during the initial portion of the opening operation to provide a partial sealing therebetween, said nozzle directing said blast of compressed gas into the arc established between said separating stationary and movable contacts during the later portions of the opening operation.

4,426,562

ROTARY SWITCH FOR SWITCHING VERY LARGE DC CURRENTS

George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 6, 1981, Ser. No. 309,289
Int. Cl.³ H01H 33/06
U.S. Cl. 200—151 28 Claims



1. A switch for switching very large DC currents comprising:

a cylindrical rotor having a first conducting element extending arcuately over at least one portion of the cylindrical surface of the rotor and axially therealong;

at least two angularly spaced stationary brush members extending radially inward toward and axially along the cylindrical surface of the rotor and terminating in arcuate surfaces complementary to and in sliding electrical contact with the cylindrical face of the rotor;

fixed insulating members extending between the brush members for electrically isolating the brush members from each other; and

means for rotating said rotor;

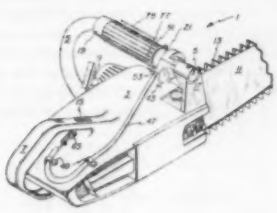
said arcuate surfaces of the brush members and said first conducting element being so dimensioned and angularly spaced apart that with said rotor in a first position, said very large current flows from one of said brush members to which it is applied through said first conducting element and into the other brush member, and with said rotor rotated to a second position, said first conducting element is no longer in electrical contact with said one brush member, thereby interrupting the flow of said very large current from said one brush member to the other through said first conducting element and said fixed insulating member defining an arc chamber for the arc which is drawn upon the interruption of the flow of current from the one brush member to the first conducting element, said arc chamber extending angularly around said rotor from said first brush member in the direction that said rotor rotates in moving from said first to second positions.

4,426,563

CHAIN SAW SAFETY SWITCH

Victor A. Grogan, R.D. #1 Hayes Rd., Schaghticoke, N.Y. 12154, assignor to Victor A. Grogan; Hope Grogan, both of Schaghticoke and Walter F. Wessendorf, Jr., Guilderland, all of N.Y.

Filed Mar. 14, 1983, Ser. No. 475,254
Int. Cl.³ H01H 9/20
U.S. Cl. 200—334 9 Claims



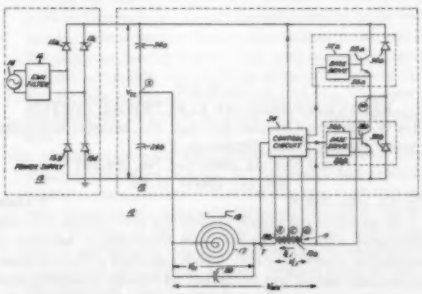
1. In a chain saw having a front handle and an on-off switch controlling drive means driving a cutting chain, a safety switch means rotatively operable in one direction to an "off" position to independently actuate via actuating means said on-off switch to its own "off" position to stop said drive means driving said cutting chain, said safety switch means being grasped and held by a hand of a human operator during the entire operation of said chain saw and, while so grasped and held, automatically rotating said safety switch means in such one direction to said "off" position when "kick-back" occurs, said safety switch means being rotatable at any time by said human operator at his option to dispose said safety switch means in its said "off" position, said front handle freely carrying thereon and rotatively mounting said safety switch means, and said actuating means operatively connecting said safety switch means with said on-off switch to actuate said on-off switch to its own said "off" position to stop said drive means driving said cutting chain upon such rotation of said safety switch means in such one direction to its said "off" position.

4,426,564

PARALLEL RESONANT INDUCTION COOKING SURFACE UNIT

Robert L. Steigerwald, Scotia; William P. Kornrumpf, and John P. Walden, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 107,259, Dec. 26, 1979, abandoned.
This application Nov. 20, 1981, Ser. No. 323,610
Int. Cl.³ H05B 6/06
U.S. Cl. 219—10.77 20 Claims



1. A parallel resonant induction surface unit forinductively

heating a substantially metallic cooking utensil positioned in proximity thereto, comprising:

a transistorized inverter with switching devices having gate turn-off capability, said inverter having an input coupled to an external power supply for supplying a square wave voltage at an output;

a main induction drive coil for inductively heating said substantially metallic cooking utensil;

a tuning capacitor in parallel with said main induction drive coil;

a second induction drive coil for inductively heating said substantially metallic cooking utensil coupled in series with the parallel combination of said main induction drive coil and said tuning capacitor, said second induction drive coil coupled in series with the parallel combination of said main induction drive coil and said tuning capacitor all being connected across the output of said inverter, said main induction drive coil, said tuning capacitor and said second induction drive coil being selected to have a magnitude so as to form a tuned circuit thereby minimizing inverter reactive currents and minimizing inverter component electrical stresses.

4,426,565

APPARATUS FOR MEASURING THE TRAVEL SPEED OF AUTOMATIC WELDING MACHINES

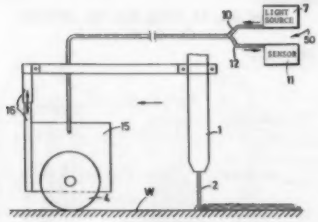
Franz Rüter, Oberhausen, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg A.G., Fed. Rep. of Germany

Filed Jun. 10, 1981, Ser. No. 272,392

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1980, 3021659

Int. Cl.³ B23K 9/10

U.S. Cl. 219—130.01 **2 Claims**



1. A device for determining the traveling speed of a workpiece and for welding the workpiece comprising:

a welding head for welding the workpiece;

a housing connected to and spaced from said welding head;

a friction wheel rotatably mounted to said housing for engaging the workpiece and rotating the relative motion between said housing and the workpiece;

a rotatable disk rotatably mounted in said housing and having at least one aperture therethrough, through which light passes as said disk rotates to produce a light signal;

gear means in said housing connected between said disk and said wheel for rotating said disk with relative motion between said housing and the workpiece;

a first fiber optic extending from one side of said housing to a remote location for receiving the light signal from said disk and transmitting it to the remote location;

a second fiber optic extending from an opposite side of said housing to the remote location for transmitting light to the disk for forming the light signal;

a light sensor connected to said first fiber optic and disposed at said remote location for sensing the light signal; and

a light source connected to said second fiber optic and disposed at said remote location for producing light to form the light signal.

4,426,566

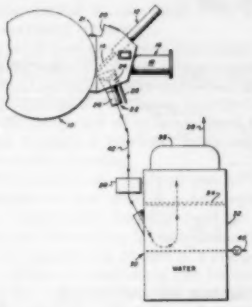
APPARATUS FOR COLLECTING PROCESS GENERATED FUME AND/OR SLAG

William J. Coughlin, Lancaster; Perry J. Rieppel, Worthington, and Stephen A. Hoffman, Lancaster, all of Ohio, assignors to Arcair Company, Lancaster, Ohio

Continuation-in-part of Ser. No. 25,320, Mar. 30, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 269,183

Int. Cl.³ B23K 9/32

U.S. Cl. 219—137.41 **9 Claims**



1. A system for collecting fume and/or waste particulate matter generated by process apparatus used to perform cutting, gouging, surface treatment or joining a workpiece which processes generate large volumes of molten metal, slag and/or fume comprising in combination:

a mounting arm adapted for positioning adjacent to a workpiece upon which the process apparatus is to perform an operation;

a hood on said mounting arm adapted to receive the process apparatus and position said process apparatus in relation to said workpiece for facilitating operation of said process apparatus;

a nozzle assembly mounted on and positioned by said hood relative to said workpiece, said nozzle assembly comprising in combination; a hollow, generally elongated outer housing having a first end adapted for positioning toward said stream of fume and/or slag and a second end adapted for connection to a device for evacutating said nozzle; a plurality of fluid directing means disposed around the inner periphery of said nozzle to direct a plurality of streams of fluid toward said second end said streams converging at a point along the longitudinal axis defined by the center line of said second end of said nozzle; and means to direct a fluid to said fluid directing means so that a mixture of air and a cooling fluid can be introduced into said nozzle to produce jets converging along a center line of said nozzle and to cover the inside of said nozzle during operation of said process, said process apparatus and said nozzle assembly juxtapositioned so that fume and/or slag generated by said process apparatus is directly toward said nozzle assembly wherein said air and cooling fluid mixture in said nozzle assembly break up molten metal and/or slag into small pieces while quenching the metal and/or slag and keep collected material in suspension without compaction or segregation,

said process apparatus and said nozzle assembly fixed at an angular relationship to each other so that said process apparatus directs generated fume and/or slag into such nozzle; and

a pump to evacuate generated fume, metal particles slag particles and/or environment containing particulate matter and cooling fluid collected in said nozzle assembly from said nozzle assembly and direct said metal, to a separator for separating said fume, collect particulate

matter and cooling fluid and return clean air to the surrounding environment.

4,426,567

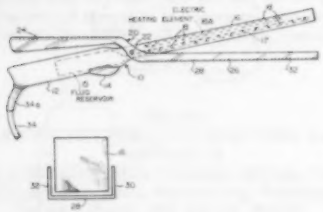
ELECTRIC HAIR CURLING IRON

Carmelo I. Gugliotti, Buenos Aires, Argentina, assignor to Andrew Turrissi, Hartford, Conn.

Continuation of Ser. No. 49,282, Jun. 18, 1979, abandoned. This application Aug. 20, 1981, Ser. No. 294,491

Int. Cl.³ A45D *1/02*; H05B *3/02*

U.S. Cl. 219—225 **3 Claims**



1. A curling iron which comprises:

a first elongated member which includes a handle at one end portion thereof and a heating element disposed at the second end portion thereof, said second end portion being elongated and having a square transverse cross-section;

a second elongated member having an elongated channel at one end portion thereof, said elongated channel including a first planar surface, and second and third planar surfaces each disposed in orthogonal relationship to said first planar surface, said second and third planar surfaces being disposed in mutually spaced relationship with a dimension therebetween which provides a snug interfitting engagement between at least an axial portion of said elongated channel and said second end portion of said first elongated member;

said first, second and third planar surfaces of said channel being substantially coextensive in length, said second and third planar surfaces having a width approximately one half of the width of a side of said second end portion of said first elongated member; and

pivot means connecting said first and second members to allow relative pivotal motion therebetween for engaging and disengaging said elongated channel and said second end portion of said first elongated member.

4,426,568

GLOW PLUG FOR DIESEL ENGINES

Yoji Kato, Okazaki; Shunzo Yamaguchi, Okazaki; Takeshi Fukazawa, Kariya, and Shinichi Saigo, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 14, 1982, Ser. No. 378,391

Claims priority, application Japan, May 21, 1981, 56-75765

Int. Cl.³ F23Q *7/22*

U.S. Cl. 219—270 **3 Claims**

1. A glow plug for diesel engines comprising:

a central rod made of alumina as an electrically insulating ceramics material;

a heat generating body attached to the outer peripheral surface of said central rod integrally with said central rod, said heat generating body being made of a mixture material consisting mainly of titanium carbide as a ceramic semiconductor material and alumina added to said titanium carbide;

a heat generating portion including said heat generating body and said central rod; and

a mounting portion secured to the outer periphery of said central rod of said heat generating portion;

wherein said heat generating body of said heat generating portion has one end and the other end, said ends constituting connecting portions for connection to electric terminals.

4,426,569

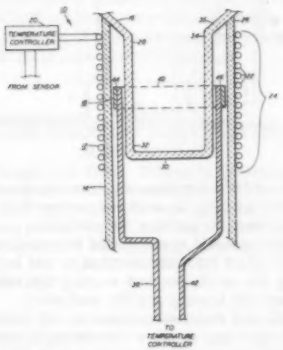
TEMPERATURE SENSOR ASSEMBLY

Mark C. Miller, Chanhassen, and John R. Arthur, Minneapolis, both of Minn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 13, 1982, Ser. No. 397,748

Int. Cl.³ C23C *13/12*

U.S. Cl. 219—272 **7 Claims**



1. A temperature sensor assembly comprising:

a crucible;

means, substantially surrounding said crucible, for radiantly heating said crucible;

a band of thermally conductive material positioned between said crucible and said means;

first and second wires affixed to said band and being spaced apart thereby, said first and second wires forming first and second thermocouple junctions with said band where affixed thereto; and

means, connected to said wires and said heating means, for monitoring and controlling the temperature of said crucible.

4,426,570

INFRARED RADIATIVE BODY AND A METHOD FOR MAKING THE SAME

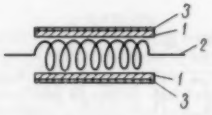
Tadashi Hikino, Ikoma; Ikuo Kobayashi, and Takeshi Nagai, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 19, 1981, Ser. No. 275,221

Claims priority, application Japan, Jul. 9, 1980, 55-94487; Sep. 5, 1980, 55-123746

Int. Cl.³ H05B 3/10; F24H 3/00

U.S. Cl. 219—354 2 Claims



1. An infrared radiative body which is composed of transparent refractory body and a refractory film thereon which absorbs visible and near-infrared radiation and transmits infrared radiation of wavelength 3~4 microns and the thickness of which is 0.02 to 0.5 microns.

4,426,571

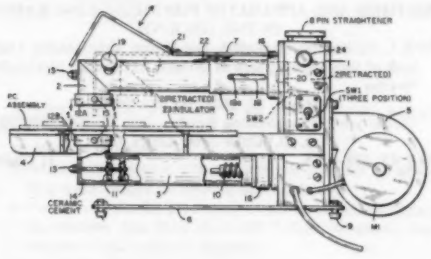
PORTABLE ELECTRIC HOT AIR REWORK TOOL FOR SOLDERING AND DESOLDERING PRINTED CIRCUIT ASSEMBLIES

Ronald A. Beck, Bloomington, Minn., assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 160,899, Jun. 19, 1980, abandoned. This application Sep. 13, 1982, Ser. No. 417,241

Int. Cl.³ B23K 3/04; H05B 3/00; H05K 3/34; F24H 3/04

U.S. Cl. 219—373 10 Claims



1. A soldering apparatus using hot air as a primary heat transfer media which controllably localizes the area of heating upon a workpiece, said solder apparatus comprising:

plenum means for confining and directing air flow from a means for producing said air flow to an air flow output end;

blower means attached to said plenum means for producing said air flow;

heater means within said plenum means for heating said air flow in said plenum means to a temperature at said air flow output end sufficient to cause solder to melt;

a removable and replaceable orifice member means with a selected predetermined size orifice for occluding said air flow output end of said plenum means and for, by said occluding at said selected predetermined size orifice, concentrating the hot air flow to a correspondingly predetermined size localized substrate area upon said workpiece; and

support grid means closely proximate to and for supporting a workpiece substrate with respect to said air flow output end of said plenum means such that said hot air flow thereof impinges either a component or components soldered to the workpiece substrate, or a localized area of the workpiece substrate where a component or components is to be added, or a portion of a component which is itself solderably fabricated and also soldered to the workpiece substrate;

wherein a soldered component or components can respectively be removed from the workpiece substrate, or a new component or components can be added thereto the workpiece substrate, or a solderably fabricated component may be disassembled or assembled while soldered thereupon the workpiece substrate;

wherein said support grid means closely proximate to said workpiece substrate upon which said component or components are soldered is also heated by said hot air flow, but which support grid means is of sufficient large grid size so as to remain sufficiently cool so as not to itself become soldered to said workpiece substrate, while remaining fully enabled for said supporting;

wherein said predetermined size localized area of heating upon the workpiece via said removable and replaceable orifice member means with predetermined size orifice means occluding said hot air flow is thusly at size of plural components, a component or a portion of a component;

wherein selective soldered components can be selectably desoldered from the workpiece substrate or selective new components soldered thereto.

4,426,572

HEATING APPARATUS WITH CHAR DETECTING AND HEATING CONTROL UNIT

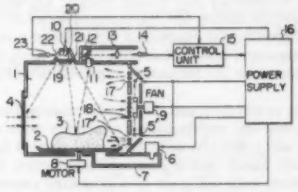
Hajime Tachikawa, Fujisawa, and Masahiro Ishihara, Yokohama, both of Japan, assignors to Hitachi Heating Appliances Co., Ltd., Chiba, Japan

Filed May 29, 1981, Ser. No. 268,373

Claims priority, application Japan, May 10, 1979, 54-57483; May 10, 1979, 54-57484; May 10, 1979, 54-57485

Int. Cl.³ H05B 1/02

U.S. Cl. 219—502 11 Claims



1. A heating apparatus comprising:

a heating chamber;

heating means capable of heating an object to be heated in said heating chamber until a surface of said object is charred to a given extent;

light source means for emitting light of visible spectrum range to illuminate the surface of said object placed in said heating chamber;

first photo sensor means for sensing the intensity of light reflected from the surface of said object;

second photo sensor means for sensing the intensity of light illuminating the surface of said object as at least one of the intensity of light emitted from said light source means and the intensity of external light entering said heating chamber;

means responsive to responsive outputs from said first and second sensor means for judging the degree of charring of the surface of said object, said judging means including means for compensating an output from said first photo sensor means on the basis of an output from said second

photo sensor means, said compensating means including means for subjecting the output from said first photo sensor means and the output from said second photosensor means to logarithmic transformation, means for subtracting the result of logarithmic transformation of the latter output from the result of logarithmic transformation of the former output, and means for subjecting the result of subtraction to logarithmic inverse transformation; and

means responsive to an output from said judging means for controlling the heating operation of said heating means.

4,426,573

PTC HEATING ELEMENT

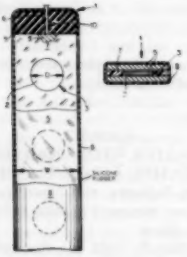
Carl S. Fudickar, Solingen-Gräfrath, and Peter Thies, Ennepetal-Voerde, both of Fed. Rep. of Germany, assignors to C. S. Fudickar K.G., Wuppertal, Fed. Rep. of Germany

Filed Dec. 10, 1981, Ser. No. 329,571

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3046995; Apr. 16, 1981, 3115396

Int. Cl.³ H05B *3/02*

U.S. Cl. 219—544 **8 Claims**



1. A heating element comprising:

an electrically nonconducting support body having a pair of opposite faces and formed with a plurality of throughgoing holes opening at said faces;

respective electrically energizable heating capsules in said holes and each having one end exposed at one of said faces and an opposite end exposed at the other of said faces;

a pair of respective conductors lying on said faces in electrical contact with the respective exposed ends of said capsules;

a tight heat conductive and electrically nonconductive skin surrounding and encapsulating said body with said capsules in said holes and said conductors on said faces, said skin being elastic and urging said conductors into snug engagement with said ends of said heating capsules; and

means including a pair of respective wires extending through said skin and connected to said conductors for passing electricity through said heating capsules.

4,426,574

FUEL PUMP COUNTER READOUT

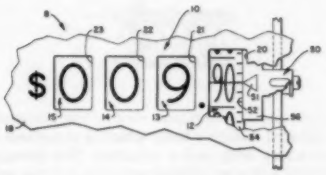
Bruno S. Smilgys, Hartford, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Dec. 11, 1981, Ser. No. 329,724

Int. Cl.³ B67D *5/22*

U.S. Cl. 235—1 C **8 Claims**

1. In a fuel dispenser counter for registering the accumulated count of fuel delivered and having a plurality of counter wheels coaxially mounted in ascending order of significance from right to left as the counter is read from the front thereof, the plurality of counter wheels having respective generally cylindrical indicia rims of generally the same diameter; the first order counter wheel being a two-place counter wheel with a one-part indicia rim and an annular arrangement of readout indicia thereon comprising a plurality of angularly spaced and axially extending count increment graduations including equiangularly spaced ten-count increment graduations and intermediate five-count increment graduations therebetween and a sequence of two-place axially readable identifying numerals of substantially constant axial width consisting solely of the numerals 00, 10, 20, 30, 40, 50, 60, 70, 80, and 90 for the ten-count increment graduations respectively; the remaining higher order counter wheels being one-place counter wheels, each with an annular arrangement of a sequence of one-place axially readable identifying numerals on its indicia rim of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9; and a graduation indicator adjacent said first order counter wheel indicia rim for reading the accumulated count of



the counter from the said front thereof including the accumulated count of the first order counter wheel with its identifying numerals and axially extending graduations; the improvement wherein the said ten-count and intermediate five-count graduations extend at least substantially the entire axial width of the two-place identifying numerals, wherein the said two-place identifying numerals are substantially angularly centered on the respective ten-count graduations and extend in both angular directions therefrom to adjacent the next said intermediate five-count graduations, and wherein said intermediate five-count graduations are directly between the two-place identifying numerals.

4,426,575

METHOD AND APPARATUS FOR MEASURING RADON IN THE GROUND

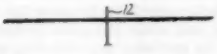
Erik L. Malmqvist, Skellefteå, and Krister Kristiansson, Lund, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Sep. 30, 1981, Ser. No. 307,278

Claims priority, application Sweden, Oct. 20, 1980, 8007337

Int. Cl.³ G01V *5/00*; G01N *5/00*

U.S. Cl. 250—253 **11 Claims**



1. A method of measuring the concentration of radon and radon daughters in the ground, especially at great depths, and/or below the ground-water level, using film-type track detectors, comprising freely suspending the detector from a wire and placing the detector in a container intended for collecting gas rising from the ground; burying the container to a desired depth beneath the surface of the ground; permitting the detector to be exposed to gas in the container over a given length of time; withdrawing the detector with the aid of said wire and a sleeve which protects the detector from contact

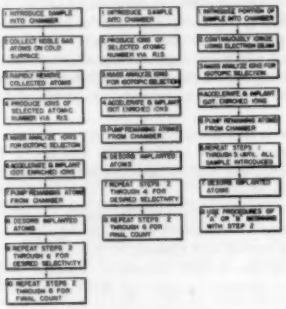
with surrounding earth; said detector being drawn up through the roof of the container and up through the ground to a location so selected that the radon and radon daughter concentration can then be determined in a known manner on the basis of the measurements registered on the detector film.

4,426,576

METHOD AND APPARATUS FOR NOBLE GAS ATOM DETECTION WITH ISOTOPIC SELECTIVITY

G. Samuel Hurst, Oak Ridge; Marvin G. Payne, Harriman; Chung-Hsuan Chen, Knoxville, and James E. Parks, Oak Ridge, all of Tenn., assignors to Atom Sciences, Inc., Oak Ridge, Tenn.

Filed Sep. 8, 1981, Ser. No. 300,019
Int. Cl.³ H01J 49/42; B01D 59/44
U.S. Cl. 250—283 29 Claims



1. Apparatus for noble gas atom detection with isotopic selectivity, which comprises:

an analysis chamber;

means communicating with said analysis chamber for admitting a gas sample containing said noble gas;

evacuation means for producing a vacuum within said analysis chamber less than about 10^{-5} Torr isolatively connected to said analysis chamber;

a pair of laser beam penetrable windows aligned across said analysis chamber;

a first pulsatory laser source aligned with said pair of windows, said first laser source capable of producing laser pulses containing wavelengths appropriate for producing ions of said noble gas via resonance ionization;

a mass filter within said analysis chamber for receiving noble gas ions produced by said laser pulses at an input and separating ions at an output according to isotopic mass;

a solid target within said analysis chamber adjacent said output of said mass filter;

means for accelerating said ions between said output of said mass filter and said target to implant said ions within said target;

electron detection means within said chamber adjacent said target to determine the number of electrons emitted from said target by said ions created by said laser pulses; and

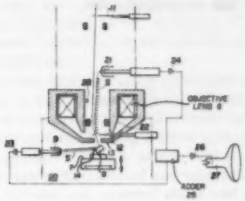
circuit means for measuring said electrons and determining the number of atoms of said noble gas with isotopic selectivity by analyzing pulses of said electrons due to the number of noble gas atoms removed from said gaseous sample by said ion implantation in said target.

4,426,577

ELECTRON MICROSCOPE OF SCANNING TYPE

Hirotami Koike, Tokyo; Hideaki Kyogoku, Kanagawa, and Masaru Watanabe, Mitaka, all of Japan, assignors to International Precision Incorporated, Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 234,790
Claims priority, application Japan, Feb. 15, 1980, 55-16534
Int. Cl.³ H01J 37/28
U.S. Cl. 250—310 5 Claims



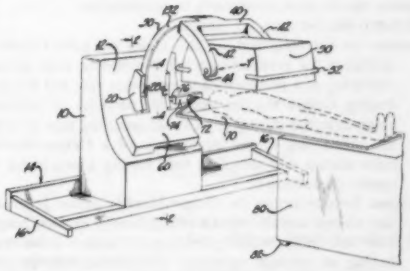
1. In an electron microscope comprising an electron optical system including an objective lens, means for irradiating a specimen to be examined with a scanning electron beam, and means enabling the distance between the objective lens and said specimen to be changed, the improvement comprising means for detecting secondary electrons emitted from said specimen irradiated by said scanning electron beam, said means comprising a pair of first and second detectors, said first and second detectors being disposed on opposite sides of the magnetic field of said objective lens, and means for simultaneously processing the output signals of said detectors.

4,426,578

SUPPORT STRUCTURE FOR ROTATABLE SCINTILLATION DETECTOR

James M. Bradcovich, Akron; Robert H. Wake, Solon; Richard M. Kovacs, Jr., and Carlos D. Pinkstaff, both of Chardon, all of Ohio, assignors to Technicare Corporation, Solon, Ohio

Filed Oct. 8, 1980, Ser. No. 195,269
Int. Cl.³ G01T 1/20
U.S. Cl. 250—363 S 17 Claims



1. A support structure for supporting and positioning a scintillation detector to a desirable location relative to a patient which comprises:

(a) a generally C-shaped support member having a yoke for pivotally supporting said scintillation detector at one end portion thereof to permit said detector to pivot about a first axis defined by said yoke;

(b) a carrier member engaging said support member and for permitting orbital movement of said support member along a predetermined planar arcuate path transverse to said first axis and defined by the shape of said support

member such that said scintillation detector is displaced relative to said carrier member during orbital movement of said support member;

(c) means for orbiting said support member along said arcuate path; and

(d) a base member rotatably supporting said carrier member and for permitting said carrier member and hence said support member axial rotation about a second axis orthogonal to said first axis such that said support member remains fixed relative to said carrier member during axial rotation of said support member.

4,426,579

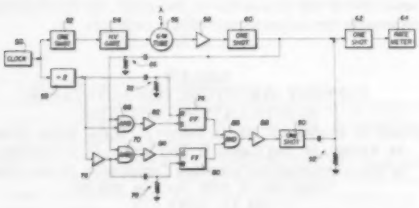
LINEARIZATION OF SAMPLED GEIGER-MUELLER RADIATION DETECTOR

Harold J. Cooley, Spring Valley, N.Y., and Elmo J. DiIanni, Mountain Lakes, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 14, 1981, Ser. No. 330,427

Int. Cl.³ G01T *1/18*

U.S. Cl. 250—374 **13 Claims**



1. Apparatus for detecting particles of radiation including gamma ray photons, comprising in combination:

Geiger-Mueller detector means;

means for operating said detector means in a pulsed mode of operation for predetermined first sampling time periods occurring at a predetermined repetition rate and for generating Geiger-Mueller pulses for particles of radiation being detected during any of said sampling time periods, the probability of the occurrence of a Geiger-Mueller pulse during said sampling time having a non-linear response characteristic;

means for converting the Geiger-Mueller pulses generated into electrical pulse signals of a generally uniform amplitude and pulse width providing a random pulse train having an average repetition rate substantially proportional to the radiation intensity of said particles of radiation;

means for generating additional electrical pulse signals in response to said Geiger-Mueller pulses occurring at different time periods following said first periods and of the same generally uniform amplitude and pulse width, said additional electrical signals being added to said pulse train and causing the average repetition rate of said pulse train to be substantially linearly proportional to said radiation intensity; and

means for measuring the average repetition rate of said random pulse train and providing an indication thereof.

4,426,580

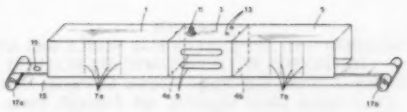
DETECTION DEVICE

Jay E. Smith, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 239,227, Feb. 27, 1981. This application May 18, 1983, Ser. No. 494,500

Int. Cl.³ G01T *1/18*; G01N *23/00*

U.S. Cl. 250—374 **4 Claims**



1. Apparatus for detecting alpha contamination on the surface of metal articles comprising;

a housing having an entrance chamber, a detection chamber and an exit chamber;

means disposed within the housing and at least in part passing through said chambers for conveying the articles through said chambers;

means for electrically grounding at least the part of said conveying means passing through said detection chamber;

means for supplying an ionizing gas to said detection chamber;

an anode in said detection chamber;

an electrical supply connected to said anode for charging said anode and establishing an electrical field in said detection chamber;

a pulse counter coupled to said anode for detecting pulses produced by ionization of the gas by alpha particles; and

means carried by said housing for substantially confining the ionizing gas in said detection chamber and restricting outflow thereof through said entrance and exit chambers.

4,426,581

ARRANGEMENT FOR MEASURING RADIOACTIVITY CONCENTRATIONS

Hans-Jürg Kreiner; Rudolf Seif, both of Munich, and Wilhelm Zimmer, Gaimersheim, all of Fed. Rep. of Germany, assignors to Munchener Apparatebau Für Elektronische Geräte Kimmel GmbH & Co. KG, Hohenbrunn and Gesellschaft Fur Strahlen-und Umweltforschung mbH, Neuherberg, both of, Fed. Rep. of Germany

PCT No. PCT/DE79/00010, § 371 Date Sep. 26, 1979, § 102(e) Date Sep. 19, 1979, PCT Pub. No. WO79/00552, PCT Pub. Date Aug. 23, 1979

PCT Filed Jan. 26, 1979, Ser. No. 167,064

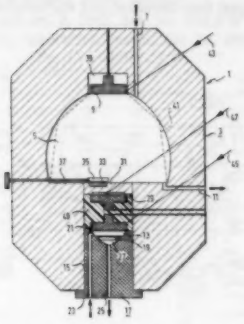
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1978, 2803440

Int. Cl.³ G01T *1/18*

U.S. Cl. 250—380 **8 Claims**

1. Device for measuring the radioactivity concentration of a gas, comprising a pressure-tight shielding housing forming a first measuring chamber, a compressor in communication with said first measuring member for introducing the gas into said first measuring chamber under high pressure, and a beta-ray detector located in said first measuring chamber, wherein the improvement comprises a shielding dividing wall located within said shielding housing and in combination with said shielding housing forming a second measuring chamber separated from said first measuring chamber by said shielding dividing wall, an aerosol filter located within said second measuring chamber and in communication with said compressor, a second detector located within said shielding housing and shielded from said first measuring chamber, said second detector is located at a position opposite said first detector and on the opposite side of said first measuring chamber from said first detector, said second detector arranged for compensating

for external radiation, a third detector located in said second measuring chamber for measuring the aerosol activity concentration present in the gas, said first, second and third detectors are formed as surface barrier layer detectors, and the exterior shape of said shielding housing in combination with the thick-



ness of said shielding housing walls and of said shielding dividing wall are selected so that the effective thickness of the shielding material shielding said first, second and third detectors from external radiation is about equal for each of said detectors independently of the direction of incidence of said external radiation.

4,426,582

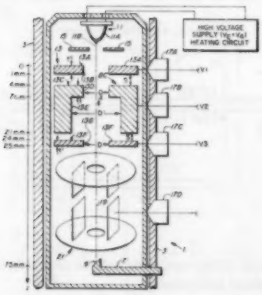
CHARGED PARTICLE BEAM APPARATUS AND METHOD UTILIZING LIQUID METAL FIELD IONIZATION SOURCE AND ASYMMETRIC THREE ELEMENT LENS SYSTEM

Jonathan H. Orloff, Portland, and Lynwood W. Swanson, McMinnville, both of Oreg., assignors to Oregon Graduate Center, Beaverton, Oreg.

Continuation of Ser. No. 113,806, Jan. 21, 1980, abandoned. This application Oct. 2, 1981, Ser. No. 308,125

Int. Cl.³ H01J *31/48, 1/88*

U.S. Cl. 250—396 ML **8 Claims**



1. An apparatus for producing a high current beam of charged particles along an axis and focusing said beam onto a small target spot, said apparatus comprising in combination:

(a) pointed emitter means for emitting said beam along said axis; said beam having an angular intensity in the range of approximately 10^{-4} to 10^{-5} amperes per steradian;

(b) an electrostatic lens system spaced from and disposed about said axis beneath said pointed emitter means for focusing said beam onto said target spot, said electrostatic lens system including

(i) a first lens element conducting a first voltage and including a first disc having therein a first aperture through which said beam passes, said first aperture being circular and centered about said axis;

(ii) a second lens element conducting a second voltage and including a second aperture through which said beam passes after it leaves said first aperture, said second lens element being spaced from and disposed beneath said first lens element,

said second aperture having an upper portion which is circular, and is centered about said axis, and has a first diameter,

said second aperture having a lower portion which is approximately cylindrical, and is centered about said axis, and has a second diameter, and has a predetermined thickness in the direction of said axis, said second diameter being substantially greater than said first diameter,

said second diameter being approximately 1.3 times as great as said predetermined thickness, and

(iii) a third lens element located entirely below said second aperture and conducting a third voltage and having a third aperture through which said beam passes only after it leaves said second aperture, said third aperture being circular and centered about said axis,

said second lens element producing an approximately constant rate of reduction in the magnitude of the potential along said axis in said lower portion of said second aperture in order to reduce the chromatic aberration caused by said electrostatic lens system.

4,426,583

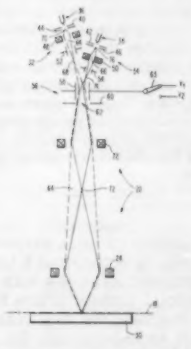
ELECTRON BEAM POTENTIAL SWITCHING APPARATUS

Tai-Hon P. Chang, Chappaqua; Phillip J. Coane, Mahopac; Fritz-Jurgen Hohn, Armonk, and Dieter P. Kern, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 10, 1982, Ser. No. 376,350

Int. Cl.³ H01J *3/14*

U.S. Cl. 250—398 **9 Claims**



1. Electron beam apparatus, comprising:

means for generating a first electron beam having a first electron potential;

means for generating a second electron beam having a second electron potential different from said first electron potential;

an electron optical column positioned to receive either of said electron beams;

means for determining which electron beam is received by said electron optical column; and

the effective source of said second electron beam being effectively positioned at a different axial distance from said electron optical column than the effective source of said first electron beam to compensate for the difference in

electron potential, so as to cause said electron optical column automatically to focus either beam onto the same final focal plane without changing the field strength of any electron optical lens in said electron optical column.

4,426,584

METHOD OF COMPENSATING THE PROXIMITY EFFECT IN ELECTRON BEAM PROJECTION SYSTEMS

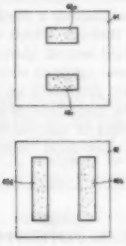
Harald Bohlen, Boeblingen; Helmut Engelke, Altdorf; Johann Greschner, Pliezhausen, and Peter Nehmiz, Stuttgart, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1981, Ser. No. 270,086

Claims priority, application European Pat. Off., Jul. 10, 1980, 80103966.0

Int. Cl.³ H01J *3/26*

U.S. Cl. 250—492.2 **4 Claims**



1. A method of compensating the proximity effect in the imaging of patterns in electron beam projection systems comprising the steps of:

(a) performing an initial electron beam exposure of a radiation sensitive layer in predetermined pattern areas through an exposure mask having openings in correspondence with said pattern areas; and

(b) subjecting selected exposed pattern areas which require compensation for loss of electron beam due to scattering during said initial exposure to at least one additional electron beam exposure through a correction mask having openings in correspondence with said selected exposed pattern areas and of a dimension smaller than the corresponding openings in said exposure mask

whereby said predetermined pattern areas receive a uniform total electron beam exposure and the proximity effect due to scattering loss of electrons during the initial exposure is compensated.

4,426,585

CIRCUIT FOR GENERATING A ROTATING FIELD FOR A THREE PHASE SYNCHRONOUS MOTOR SERVING AS A FLYWHEEL STARTER FOR A VEHICLE INTERNAL COMBUSTION ENGINE

Erhard Bigalke, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,254

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113092

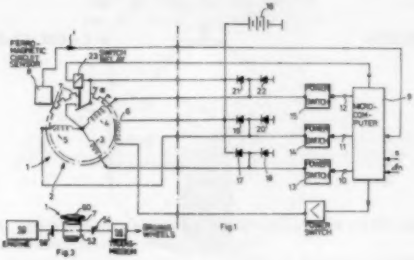
Int. Cl.³ H02K *19/36*; B60K *9/04*; H02P *7/36*

U.S. Cl. 290—38 B **8 Claims**

1. In combination with a brushless, three phase synchronous motor and an internal combustion engine having a flywheel, said motor acting as a driving motor for a flywheel wherein said flywheel is capable of coupling as a flywheel starter for said engine, said motor having a stator rigidly connected to stationary elements of said engine and a plurality of field windings, and a winding-free toothed rotor rigidly connected to said flywheel and having a pole pitch angle, a circuit for generating a rotating field for said field windings comprising:

ferromagnetic sensor means positioned proximate said toothed rotor for generating signals indicative of the pole pitch time of said rotor;

divider circuit means coupled to said sensor signals for generating a current flow signal for each field winding in response to said sensor signals, said current flow signals having equal time duration, and the sum of the durations



of said current flow signals being less than said pole pitch time; and

delay network means coupled to said divider circuit means for determining a time delay between the start of said pole pitch time and the start of said current flow signals which is optimal for the prevailing operation of said motor.

4,426,586

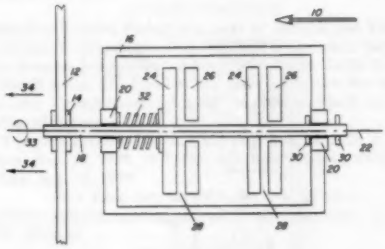
DRAG RESPONSIVE REGULATED VOLTAGE POWER GENERATION

Albert B. P. Cecchini, Philadelphia, Pa., assignor to Warren Erection Co., Inc., Warren, Pa.

Filed Apr. 20, 1981, Ser. No. 255,501

Int. Cl.³ F03D *7/04*

U.S. Cl. 290—44 **24 Claims**



1. In a generator of the type adapted for extraction of power from a moving fluid comprising:

blade means mounted on a rotatable shaft,

coil means mounted on said shaft, and

field means separated from said coil means by a spatial gap,

the improvement comprising:

mounting said shaft slidably with respect to said field means, and

providing resilient means for maintaining said gap at a minimum dimension,

whereby said shaft moves axially in response to drag between said moving fluid and said blade means;

whereby the dimension of said gap is varied in response to said drag, said dimension being increased in response to increases in said drag.

4,426,587

POWER SUPPLY DISTRIBUTION SYSTEM

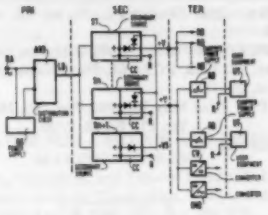
Christian Nouet, Ste Genevieve des Bois, France, assignor to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jul. 9, 1982, Ser. No. 396,579

Claims priority, application France, Jul. 10, 1981, 81 13645

Int. Cl.³ G05D *23/00*

U.S. Cl. 307—66 14 Claims



1. A power supply distribution system, in particular for an exchange comprising electronic user equipments which are powered at low voltage with electricity derived from a high voltage AC network, and with the user equipments being disposed in racks and with groups of the racks being fed with high voltage directly from a primary distribution system connected to said network, wherein the said racks and groups of racks include a secondary level of power supplies which provide galvanic isolation from the primary system and which deliver power at at least one intermediate fixed voltage relative to an installation reference potential to a third level of power supplies which are connected directly to said user equipment.

4,426,588

WEIGHTING CIRCUIT FOR AN ELECTRICAL TORQUE SIGNAL IN A DRILLING MACHINE

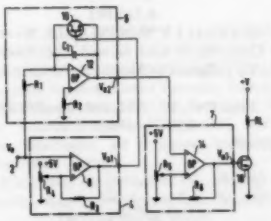
Walter Weilenmann, Schaanwald, Liechtenstein, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jul. 7, 1982, Ser. No. 396,036

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1981, 3128410

Int. Cl.³ H01H *35/00*

U.S. Cl. 307—124 12 Claims



1. A weighting circuit for providing a trigger signal in response to a torque signal corresponding to torque developed in a hand tool, wherein the trigger signal influences operation of the tool, comprising first sensor means for comparing the amplitude of the torque signal with a first predetermined level and for providing an output signal when the amplitude of the torque signal exceeds the first predetermined level, integrator means for integrating the torque signal in response to the output signal of the first sensor means and for producing an integration value, second sensor means for comparing the integration value from said integrator means with a second predetermined level and for providing a corresponding output signal, and means for producing the trigger signal in response to the output of said second sensor means, wherein said first sensor means includes a first variable voltage divider, a first operational amplifier having an inverting input for receiving said torque signal and a non-inverting input coupled to said first variable voltage divider, and a first resistor coupled between said non-inverting input and the output of said first operational amplifier.

4,426,589

LOW-LOSS SEMICONDUCTOR SWITCHING CIRCUIT

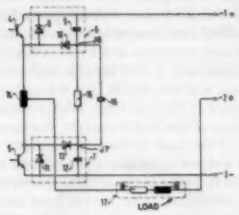
Helmut Möder, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 332,747

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101412

Int. Cl.³ H03K *3/01, 17/60*

U.S. Cl. 307—254 15 Claims



1. Low-loss semiconductor switching circuit having

a voltage supply (1, 2, 3),

a control system to control current flow, in respectively controlled direction, to a load (17) including

a first controlled semiconductor switch (4);

a second controlled semiconductor switch (5);

means (14) including an inductance (17, 19) connecting together one main current terminal of the respective semiconductor switches, and further to connect said main current terminals to the load, the other main current terminals of the semiconductor switches being connected to the voltage supply;

a first network (6) connected in parallel across the main current terminals of the first semiconductor switch and including first means (9) for storing energy connected to receive and store switching energy arising upon changing of switching state of the first semiconductor switch;

a second network (7) connected in parallel across the main current terminals of the second semiconductor switch (5) and including second means (12) for storing energy connected to receive and store switching energy arising upon changing of switching state of the second semiconductor switch;

and comprising, in accordance with the invention,

an additional network (15, 16; 20; 21–26) connecting the energy storing means (9, 12) of said first network (6) and the second network (7) and carrying between said first and second networks which arise upon changing of switching state of a respective one of the semiconductor switches (4, 5),

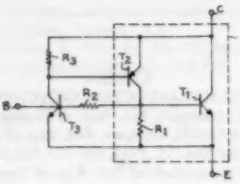
the inductance in the means (14) connecting the main current carrying paths of the semiconductor switches receiving and storing switching energy arising upon control of one of the first or second semiconductor switches (4, 5) between conductive or turn-ON state and non-conductive, or blocked state.

4,426,590

SWITCH CONTROLLABLE OFF AND ON BY PULSES

Klaus Rischmuller, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 19, 1981, Ser. No. 323,076
Claims priority, application France, Nov. 21, 1980, 80 24798
Int. Cl.³ H03K 17/00
U.S. Cl. 307—255 8 Claims



1. A switch whose opening and closing is controlled by pulses comprising;

main terminals corresponding to the collector and emitter of a first power transistor of a first type and a second transistor of a second type connected by its emitter to the collector of said first transistor and by its collector to the base of said first transistor, a first resistor being inserted between the base and emitter of said first transistor;

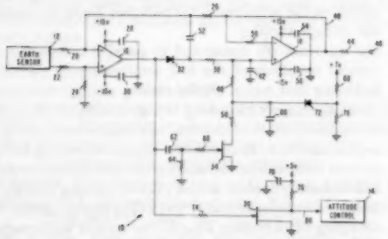
a third transistor of the first type, whose emitter is connected to the emitter of the first transistor, the base to the connection point of the base of the first transistor and the collector of the second transistor via a second resistor and the collector to the base of the second transistor; a third resistor being connected between the base and the emitter of the second transistor; and a control terminal being connected to the base of the third transistor.

4,426,591

ADAPTIVE COMPARATOR

Donald R. Cargille, Venice, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Aug. 4, 1980, Ser. No. 175,112
Int. Cl.³ H03K 5/153
U.S. Cl. 307—358 9 Claims



1. An adaptive comparator for use in combination with a rizon sensor, said sensor having means for detecting radia- n from a celestial body and means for generating an output se in response thereto which serves as an input to said nparator, said comparator comprising:

irst circuit means for setting a predetermined input signal amplitude threshold;

econd circuit means for comparing said input signal to said threshold and for generating an output signal when said input signal exceeds said threshold;

ird circuit means coupled to said second circuit means for setting a second input signal amplitude threshold which corresponds to an average of that portion of recent input signals which exceeded the previous amplitude threshold; and

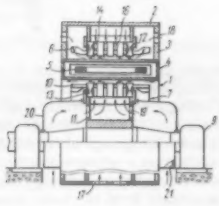
fourth circuit means for resetting said third circuit means.

4,426,592

ELECTRICAL MACHINE WITH SUPERCONDUCTING INDUCTOR AND GAS COOLING OF NORMAL-CONDUCTIVITY WINDINGS

Evgeny K. Berzin, ulitsa Sverdlova, 175, kv. 181; Anatoly G. Miroshnichenko, ulitsa Sluzhebnaya, 53, kv. 2, and Leonid I. Yantovsky, ulitsa 23 Avgusta, 40, kv. 51, all of Kharkov, U.S.S.R.

PCT No. PCT/SU80/00090, § 371 Date Jan. 18, 1982, § 102(e) Date Jan. 18, 1982, PCT Pub. No. WO81/03585, PCT Pub. Date Dec. 10, 1981
PCT Filed May 30, 1980, Ser. No. 342,013
Int. Cl.³ H02K 9/00
U.S. Cl. 310—52 5 Claims



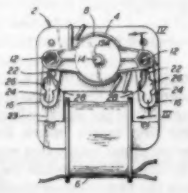
1. An electrical machine with a superconducting inductor and gas cooling of normal-conductivity windings, comprising a stator with a superconducting winding disposed in a cryostat and a rotor with a cooled winding disposed on its body, the rotor being mounted in rotation bearings, characterized in that the stator **1** carries a winding **6** which balances the electromagnetic moment of the rotor **7**, acting upon the superconducting winding **5** of the stator, and which is made of normal-conductivity conductors, and the stator **1** is provided with a housing **2** to whose walls the cryostat **4** is secured so as to define a gap for the passage of a gaseous coolant between the external surface of the cryostat **4** and the normal-conductivity winding **6** of the stator.

4,426,593

UNIVERSALLY MOUNTABLE MOTORS

Edward A. Chernoff, Brookville, and Paul Levy, Lindenhurst, both of N.Y., assignors to Motors & Armatures, Inc., Hauppauge, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,496
Int. Cl.³ H02K 5/00
U.S. Cl. 310—91 8 Claims



1. A universally mountable motor comprising an armature having first and second opposite faces and defining a cylindrical bore, first and second bearing brackets secured to the armature at the first and second faces respectively and spanning the

bore, bearing means mounted in the first and second bearing brackets and defining a common axis of rotation which is coaxial with the bore, and a rotor fitted in the bore and supported by the bearing means to rotate in the bore, at least said first bracket being formed with wings which extend over said first face of the armature on opposite sides of said axis, each wing being formed with an elongate retaining slot defining a central axis and having a first region whereby a mounting member can be removably inserted into the slot and at least first and second additional regions which are spaced apart along said central axis and into which the mounting member can be selectively displaced from said first region to be captively retained in one of said additional regions, the central axes of the retaining slots respectively being inclined to each other and said first additional regions being closer together than said second additional regions.

4,426,594

COMMUTATOR FOR A MOTOR AND METHOD OF MAKING THE SAME

Hiroaki Hirano, Miyashiro, and Takashi Hondo, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 4, 1981, Ser. No. 289,879
Claims priority, application Japan, Aug. 11, 1980, 55-110869
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—233 **5 Claims**

1. A commutator for use in a motor having a stator and a rotor with a rotary shaft, said commutator consisting of a plurality of commutator segments attached to an insulating body, each of said commutator segments having a contact surface which is contacted by a brush, said commutator being characterized in that a number of randomly spaced hemispherical impressions are provided on each of said commutator segments to form a rough surface thereon.

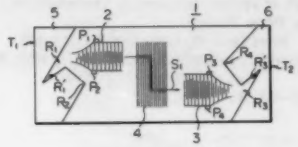
4,426,595

ACOUSTIC SURFACE WAVE DEVICE WITH IMPROVED BAND-PASS CHARACTERISTICS

Kuninori Kawaura, Suzaka; Sumio Yamada, Kawasaki; Noboru Wakatsuki, Kawasaki; Masaaki Ono, Kawasaki; Shigeo Tanji, Yokohama; Yoshiro Fujiwara, Kawasaki, and Masanobu Yanagisawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 22, 1982, Ser. No. 341,683
Claims priority, application Japan, Jan. 30, 1981, 56-12536
Int. Cl.³ H01L *41/10*
U.S. Cl. 310—313 D **11 Claims**

1. An acoustic surface wave device comprising:
a piezoelectric substrate having a plane surface for propagation of acoustic surface waves along a propagation path;
an input transducer formed on the surface of said piezoelectric substrate, for converting electrical energy into said acoustic surface waves;
an output transducer formed on the surface of said piezoelectric substrate, for converting said acoustic surface waves into another type of electrical energy; and
acoustical absorbent layer patterns of a triangular configuration having at least one V-shaped recess portion and at least one V-shaped protruding portion, formed on the surface of said piezoelectric substrate behind said input and output transducers, respectively;
each said V-shaped recess portion, of said acoustical absor-



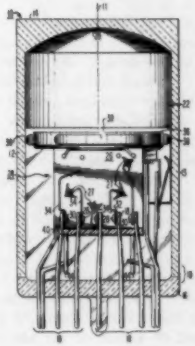
bent layer patterns of a triangular configuration, having a further recess portion whose line of symmetry is formed diagonally with respect to the propagation path of said acoustic surface waves.

4,426,596

PHOTOMULTIPLIER TUBE HAVING A HEAT SHIELD WITH ALKALI VAPOR SOURCE ATTACHED THERETO

Gilbert N. Butterwick, Leola, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 24, 1981, Ser. No. 237,845
Int. Cl.³ H01J *40/00*
U.S. Cl. 313—534 **8 Claims**



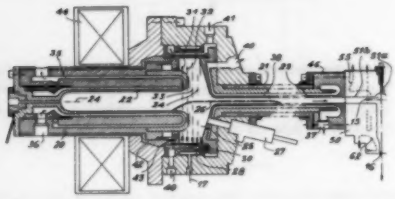
1. In a photomultiplier tube having a longitudinally-extending tube axis, said tube comprising an evacuated envelope including a generally cylindrical wall member, said wall member being closed at one end by a faceplate and at the other end by a stem, said stem being heat sealed to said wall member,
at least one source of alkali vapor within said envelope,
a photoemissive cathode formed by said alkali vapor on said faceplate,
a dynode cage assembly spaced from said cathode in proximity to said stem, and
electrical connecting means extending through said stem for energizing said cathode, said dynode cage assembly and said source of alkali vapor, the improvement comprising:
a heat shield disposed transversely to said tube axis between said dynode cage assembly and said stem, said heat shield comprising a substantially inert, insulative material, said source of alkali vapor being mounted on said heat shield facing said dynode cage assembly, said heat shield protecting said dynode cage assembly and said source of alkali vapor from the deleterious effects of heat generated during the heat sealing of said stem to said wall member.

4,426,597

IONIZED GAS GENERATOR AT VERY HIGH TEMPERATURE AND VERY HIGH PRESSURE

Serge Denoyer, Andresy; Jacques Guerin, Pessac; Maxime Labrot, Bordeaux, and Jean-Pierre Serrano, Saint-Aubin-de-Medoc, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 30, 1980, Ser. No. 221,498
Claims priority, application France, Jan. 7, 1980, 80 00231
Int. Cl.³ H01J 17/26, 7/24
U.S. Cl. 313—231.41 3 Claims



1. An ionized gas generator for supplying a supersonic homogeneous ionized gas flow comprising a plurality of unitary ionized gas generator modules connected to a coupling chamber having a nozzle for supplying a jet of ionized gas, each of the unitary gas generator modules comprising an upstream and a downstream hollow elongated substantially cylindrical electrode of copper or copper alloy, the electrodes being coaxial and spaced apart by an intermediate chamber to which an open first end of each electrode is connected, the upstream electrode having an opposite second end that is closed and the downstream electrode having an opposite second end that is open and in communication with the coupling chamber; means for supplying a high voltage of at least several thousands of volts to the electrodes; means for striking an arc between the electrodes; means for injecting a vortical gas along a plurality of planes perpendicular to the axis of the electrodes in the intermediate chamber therebetween, the injected gas passing through the electric arc and the center of the downstream electrode and causing the electric arc to take an elongated shape such that the arc has a length several times greater than the spacing between the electrodes and is capable of extending from the upstream electrode to the region of the second end of the downstream electrode; moveable magnetic field means for generating around the upstream electrode a magnetic field to cause displacement of a base of the electric arc about the interior surface of the upstream electrode; and means for cooling the electrodes, the gas injecting means, and the coupling chamber.

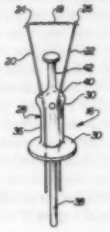
4,426,598

INCANDESCENT LAMP LEADS OF DISPERSION STRENGTHENED COPPER WIRES

Charles I. Whitman, Bay Village, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Feb. 2, 1982, Ser. No. 344,890
Int. Cl.³ H01J 5/50
U.S. Cl. 313—331 20 Claims

1. An incandescent electric lamp having a translucent envelope which encloses a resistive incandescent filament electrically connected to and supported by a pair of lead wires comprising at least in part substantially completely deoxidized internally oxidized dispersion strengthened copper wire in which is dispersed a metal oxide refractory to the extent of from 0.07% to 0.35% calculated as its metal equivalent, said



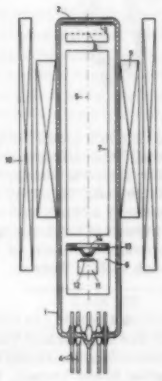
lead wires containing from 0.001% to 0.06% free boron and less than 0.002% free oxygen.

4,426,599

TELEVISION CAMERA TUBE

Nicolaas H. Limper, and Cornelis J. W. M. Scheffers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,437
Claims priority, application Netherlands, Aug. 22, 1980, 8004748
Int. Cl.³ H01J 31/26
U.S. Cl. 313—389 8 Claims

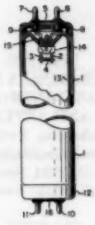


1. A television camera tube comprising:
an evacuated envelope;
a photosensitive target in the envelope;
an electron gun for generating an electron beam;
means for focusing the electron beam to a spot on the target, the electron spot having a shape which is defined by a line at the edge of the spot which connects points having the same current density;
means for scanning the electron spot across the target in a line deflection direction and in a frame deflection direction;
means for shaping the electron spot into an elongate shape, wherein the ratio, k, between the lengths of the long and short axes of the spot is $1.4 \leq k \leq 2$, and where the long axis of the spot divides the acute angle between the line deflection direction and the frame deflection direction in such manner that the angle, β, between the long axis and the frame deflection direction is $0 \leq \beta \leq 60°$.

4,426,600
STANDARD WHITE FLUORESCENT LAMPS EMPLOYING BLEND

Charles F. Chenot, Towanda, Pa., and Wolfgang Walter, Brookline, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 830,796, Sep. 6, 1977, abandoned. This application Jun. 22, 1979, Ser. No. 51,303
Int. Cl.³ H01J 61/44
U.S. Cl. 313—487 3 Claims



1. A fluorescent lamp comprising a sealed envelope, electrodes therein, a filling of inert gas, and a mercury therein, and a coating of phosphor on the inside surface of said envelope, characterized in that said phosphor consists essentially of a blend exhibiting x and y color coordinates equivalent to standard white of from about 405 to about 415 and from about 390 to about 405 respectively, said blend consisting essentially of from about 10 to about 35 weight percent of a blue emitting phosphor having the formula $Sr_{5-x-y}Eu_xMn_y(PO_4)_3Cl_2$ wherein x is from about 0.005 to about 0.15 and y is from 0 to about 0.25, said blue emitting phosphor having a first peak emission of from about 440 to about 450 nanometers and a 50% bandwidth of from about 25 to about 65 nanometers and if y is greater than 0, a second peak emission of from about 580 to 610 and a 50% bandwidth of about 50 to 100 nanometers and the balance being a yellow emitting phosphor composition having the formula,

$$Ca_{5-w-x-y}Cd_wMn_xSb_y(PO_4)_3F_{1-y-a}Cl_aO_y$$

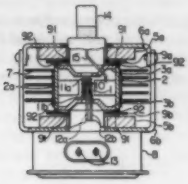
wherein
w is from 0 to about 0.05
x is from 0.13 to about 0.17
y is from 0.02 to about 0.04
a is from about 0.02 to about 0.1,
and having a peak emission of from about 565 to about 575 nanometers and a 50% bandwidth of from about 60 to about 100 nanometers whereby said lamp yields higher lumens per watt than an equivalent standard white lamp.

4,426,601
MAGNETRON

Mamoru Tsuzurahara, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 14, 1981, Ser. No. 283,154
Claims priority, application Japan, Jul. 14, 1980, 55-95095
Int. Cl.³ H01J 25/50
U.S. Cl. 315—39.51 3 Claims

1. A magnetron including a cylindrical anode, a cathode disposed on an axis of said cylindrical anode, a pair of pole pieces respectively arranged at both ends of said cylindrical anode, a pair of permanent magnets each arranged on an outside of the corresponding one of said pole pieces in an axial direction of said cylindrical anode, and a pair of intermediate rings each arranged between one of said pole pieces and the corresponding one of said permanent magnets, and having a circular plane shape, wherein each of said intermediate rings comprising: a disc portion; a plurality of first projections formed on one of the surfaces of said disc portion and abutting on the corresponding pole piece; and a plurality of second

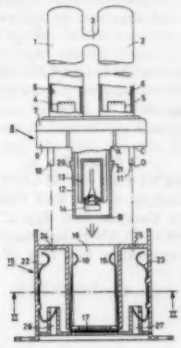


projections formed on the other surface of said disc portion and abutting on the corresponding permanent magnet.

4,426,602
LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

Adrianus J. T. Mollet, Rooscndaal, and Rudolf Sanders, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 29, 1981, Ser. No. 268,208
Claims priority, application Netherlands, Jun. 4, 1980, 8003277
Int. Cl.³ H01J 7/44, 61/56
U.S. Cl. 315—58 3 Claims



1. A low pressure mercury vapor discharge lamp comprising a discharge tube closed in a vacuum-tight manner and containing mercury and a rare gas and electrodes, positioned one at each end of said discharge tube, for maintaining a discharge during operation of said lamp, said discharge tube being of such configuration that the ends thereof are in a side-by-side relationship at one end of the lamp and are both connected to a single lamp base provided with connecting pins, characterized in that the lamp base has an axially projecting wall portion having a non-circular cross-section positioned between said connecting pins, projecting beyond said pins and containing a starter for said lamp.

4,426,603
HPS STARTING AID

Edward H. Mustoe, Austin, Tex., assignor to Wide-Lite International Corporation, San Marcos, Tex.

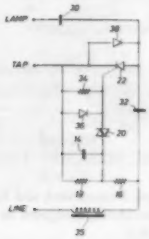
Filed Nov. 16, 1981, Ser. No. 321,431
Int. Cl.³ H05B 41/14
U.S. Cl. 315—289 11 Claims

1. In combination with a high intensity, gaseous discharge lamp requiring high voltage starting pulses and a transformer ballast for operating the lamp once the lamp is lit, the improve-

ment of a lamp starting aid being connected respectively to a ballast connection to the lamp, a ballast starting tap connection, and a ballast connection to the power distribution line, comprising

a capacitive voltage divider connected in series between said lamp and line connections and unlimited by a connection to a power resistor for quickly charging to full charge in the presence of applied power on said line,

a thyristor connected between the divider junction of said divider and said tap,



a voltage breakdown device connected to said thyristor gate,

a timing RC network connected to said voltage breakdown device and to said power distribution line,

the RC network components determining the timing of the gating on of said thyristor by determining the voltage breakdown occurrence of said voltage breakdown device,

the size of the capacitors in said capacitor divider and the number of turns on the ballast between said tap and lamp connections determining the pulse width and amplitude of said starting pulses.

4,426,604

DIRECT CURRENT FAN WITH CONTROL MEANS

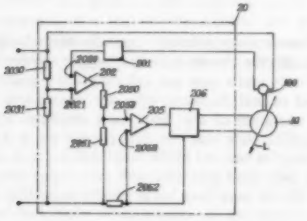
Benno Doemen, Talstiege 8, and Rolf Müller, Ackerstr. AB, both of D-7742 St. Georgen, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 244,980

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024613

Int. Cl.³ H02P *7/06*

U.S. Cl. 318—334 **2 Claims**



1. In a fan driven by a direct current motor, a control circuit for limiting inrush current on starting and for controlling fan speed, comprising:

a comparator having two inputs;

means for generating a first signal, said first signal having a value directly related to a physical condition of the air stream through the fan, said first signal being fed to one of the inputs of said comparator; and

means for generating a second signal, said second signal having a value directly related to the load current of the motor, said second signal being fed to the other of the two inputs of said comparator, whereby the speed of said fan will vary in accordance with change in the physical condition of the air stream through the fan.

4,426,605

METHOD OF OPERATING A SHUNT-WOUND DC MOTOR AS WELL AS CONTROLLING DEVICE FOR THE EXECUTION AND APPLICATION THEREOF

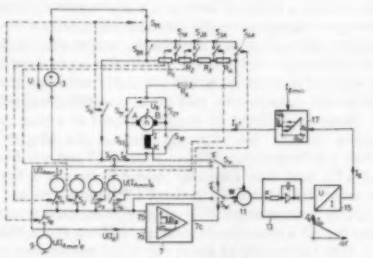
Luigi Steinbrecher, Neuhausen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Switzerland

Filed Nov. 23, 1981, Ser. No. 324,319

Claims priority, application Switzerland, Jun. 5, 1981, 3701/81

Int. Cl.³ H02P *5/06*

U.S. Cl. 318—347 **7 Claims**



1. A controlling device for controlling a shunt-wound DC-motor having a field and an armature in operative relation with the field, said device comprising:

current measuring means **(5)** for measuring current in the armature;

variable reference signal generating means **(9)**;

comparator means **(7)**, said current measuring means **(5)** and said generating means **(9)** having outputs connected to inputs of said comparator means;

an energizing circuit for the armature including variable resistance means **(R1, R2, R3, R4)**;

control means(S_{1A}, S_{2A}, S_{3A}, S_{4A}, S_{0A},S_0, S_1, S_2, S_3, S_4) for controlling said variable resistance means and said generating means;

controllable field excitation current actuating means **(13, 15, 17)** for establishing field excitation current of predetermined value, said field excitation current being adjustable by a control signal applied to said actuating means **(13, 15, 17)** at a control input thereof;

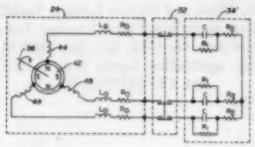
switching means (S_X, S_W) controlled by the output of said comparator means **(7***c***)**;

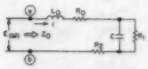
difference forming means **(11)** having a first input connectable by said switching means (S_W) to said generating means **(9)** at its output, said difference forming means also having a second input connectable by said switching means (S_X) to said current measuring means **(5)** at its output, and said difference forming means producing an output that acts as a control difference signal applied to said control input of said excitation current actuating means **(13, 15, 17)** as a regulator for the current in the armature.

4,426,606
EMERGENCY STOP DEVICE FOR BRUSHLESS MOTORS

Muneo Suita, and Kazuo Mogi, both of Ueda, Japan, assignors to Sanyo Denki Co., Ltd., Tokyo, Japan and Electro-Craft Corp., Hopkins, Minn.

Filed Nov. 8, 1982, Ser. No. 439,942
Int. Cl.³ H02P *3/12*
U.S. Cl. 318—375 **3 Claims**





1. In a brushless motor control system including a power source connected to the windings of a brushless motor for supplying power thereto, improved damper means for connection to the windings for dissipating the energy stored therein comprising, in combination:

first resistance means for dissipating energy stored in the winding of the motor;

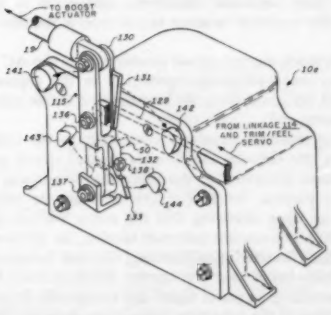
second resistance means in series with said resistance means; and

capacitance means connected in parallel with said first resistance means constructed and arranged for combination with said first resistance means and said second resistance means for minimizing the impedance of said damping means at high motor rotation rates and increasing the impedance of the damping means at low rotational rates to optimize the deceleration of said brushless motor when said damper means is connected to the motor windings.

4,426,607
DIFFERENTIAL LINKAGE APPARATUS FOR AN AIRCRAFT SERIES SERVOACTUATOR APPARATUS

Homer D. Black, Phoenix, and Charles R. Stribley, Scottsdale, both of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,532
Int. Cl.³ G05B *11/01*
U.S. Cl. 318—628 **3 Claims**



1. A series servoactuator for installation in an aircraft comprising:

(a) a servomotor having a housing adapted to be secured to the airframe and coupled between a pilot's control linkage and a control surface linkage and including a servomotor output drive shaft extending from a side wall of said housing,

(b) first and second pairs of stop means fixed on said housing side wall, each pair being symmetrically angularly spaced relative to said drive shaft,

(c) a servo drive link secured to said drive shaft having first stop engaging surfaces thereon adapted to engage said first pair of housing stop means for limiting the authority of said servomotor,

(d) an elongated differential link having one end pivotally mounted on said servo drive link, having its opposite end pivotally connected to said control surface linkage and having an intermediate point thereon pivotally connected to said pilot's control linkage, said differential link having second stop engaging surfaces thereon adapted to engage said second pair of housing stop means for limiting the authority of said pilot's control linkage,

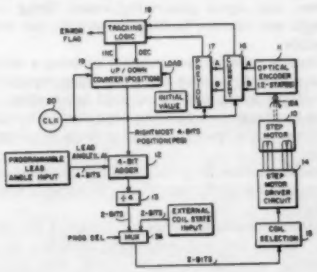
said second stop engaging surfaces of said differential link having a contour such that when they engage one or the other of said second housing stop means, any motion of said servo link will result in no effective motion of said differential link and control surface linkage; and

said differential link being further characterized in that said second stop engaging surfaces comprise flange means laterally extending from the differential link, the lateral dimension thereof being variable between predetermined values dependent upon the authority limits required by the pilot's control linkage of a particular aircraft installation.

4,426,608
STEPPING MOTOR CONTROL SYSTEM

Noble G. Larson; John A. Purbrick, both of Arlington, and Matthew T. Mason, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 10, 1981, Ser. No. 253,035
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—685 **11 Claims**



1. A stepping motor control system comprising

stepping motor means having means for rotating through a plurality of steps during each revolution thereof and a plurality of selectably actuated coil means having a selected number of coil states for moving said rotating means through a selected number of sub-step positions within each of said plurality of steps;

means for sensing the sub-step positions of said rotating means and for providing a position signal representing the position of said rotating means relative to an initial position thereof;

means for providing a signal representing a selected lead angle;

means for combining said lead angle signal and said position signal to produce a coil state excitation signal representing a selected combination of said plurality of coil means which are to be actuated in response to said coil state signal; and

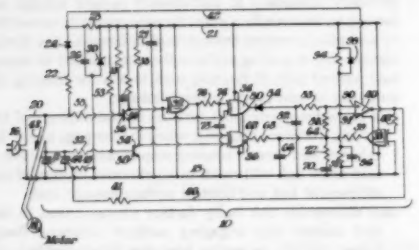
motor drive circuit means responsive to said coil state excitation signal for actuating said selected combination of said coil means to move said rotating means in response thereto.

4,426,609

POWER FACTOR CONTROLLER

Bela G. Nagy, Acton, and Alfredo H. Saah, Malden, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 1, 1981, Ser. No. 259,726
Int. Cl.³ H02P 5/40
U.S. Cl. 318—729 7 Claims



1. A power factor controller for being interposed between an induction motor and an AC power line comprising:

(a) an integrating means including an integrating capacitor for charging and generating across said integrating capacitor a voltage having a magnitude that is inversely related to the lag time by which the current of said motor periodically reaches zero later than a preceding zero crossing of the AC power line voltage; said integrating means comprising a signal generator means for generating a signal voltage having a predetermined value during each half period of said AC power line except that it becomes near zero volts at each instance of zero crossing of said power line voltage and remains zero until the following zero crossing of said motor current, and a current limiting resistor, said signal generating means being connected through said current limiting resistor to said integrating capacitor;

(b) a ramping capacitor and resistor forming a series circuit that is connected across said integrating capacitor so that the voltage appearing across said integrating capacitor serves to charge said ramping capacitor and to determine the slope of the resulting ramp voltage developed thereacross;

(c) a resetting means for periodically discharging said ramping capacitor at each time of zero crossing of said AC line voltage;

(d) a detector-threshold means for detecting the sum of said ramp voltage and said integrating capacitor voltage and producing a trigger voltage when said voltage sum reaches a predetermined threshold value;

(e) a bidirectional triode thyristor for connecting said motor to said AC power line at each occurrence of said trigger voltage and disconnecting said motor at each occurrence at which said motor current falls to zero; and

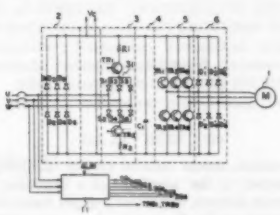
(f) a DC power supply means; said signal generator means comprising a first grounded-emitter-type transistor amplifier stage powered from said DC supply means having a first bipolar transistor and a first base resistor, said first resistor being connected between the base of said first transistor and the anode/cathode of said thyristor and the cathode/anode of said thyristor being connected to the emitter of said first transistor; and a second grounded-emitter type transistor amplifier stage powered from said DC supply means having a second bipolar transistor and a second base resistor, the base and the emitter of said second transistor adapted to be connected to two lines respectively of said AC power line through said second resistor; and an exclusive OR gate means for producing said signal voltage of a predetermined non-zero value during said each half AC voltage period when the signals at the collectors of said first and second transistors are the same, and for otherwise producing said near zero voltage.

4,426,610

INDUCTION MOTOR CONTROL SYSTEM

Shigeki Kawada, Hino, and Katsuo Kobari, Tachikawa, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 388,924
Claims priority, application Japan, Jun. 19, 1981, 56-92797
Int. Cl.³ H02P 5/40
U.S. Cl. 318—798 8 Claims



1. An induction motor control system for controlling the actual speed of an induction motor in accordance with a commanded speed, the system having a braking mode in which a regenerative current is generated, said system comprising:

a rectifier connect able to an AC power supply for converting alternating current into direct current;

a transistor inverter including a plurality of transistors operatively connected to receive the direct current and connectable to the induction motor, for converting the direct current into three-phase AC signals for driving the induction motor and having a voltage and frequency in conformance with a deviation between the commanded speed and the actual speed of the induction motor;

an inverter control circuit operatively connected to the transistor inverter, for providing switching signals for controlling the switching action of the plurality of transistors comprising the transistor inverter;

a regenerative circuit connectable to the AC power supply including a plurality of switching elements, the regenerative circuit being connected in parallel with the transistor inverter for controlling the flow of the regenerative current during braking;

a smoothing capacitor operatively connected in parallel with the transistor inverter and to receive the direct current;

a regeneration control circuit connectable to the AC power supply and operatively connected to the regenerative circuit, for controlling the regenerative circuit switching elements; and

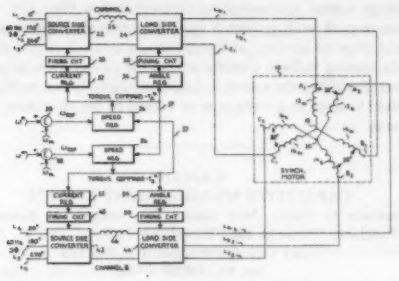
detecting means, operatively connected to the induction motor and between the inverter control circuit and the transistor inverter, for detecting the magnitude of the motor current, for temporarily disabling the transistor inverter upon detecting that the motor current has exceeded a first current detection level I_1, for enabling said transistor inverter upon detecting that said motor current has fallen below said first current detection level I_1, and for providing an alarm signal and completely halting the operation of the induction motor upon detecting that the motor current has exceeded a second current detection level I_2 being greater than the first current detection level I.

4,426,611

TWELVE PULSE LOAD COMMUTATED INVERTER DRIVE SYSTEM

Paul M. Espelage, Salem, Va.; David L. Lippitt, Scotia, and Leland C. Tupper, Schenectady, both of N.Y., assignors to General Electric Company, Salem, Va.

Filed Apr. 28, 1982, Ser. No. 372,749
Int. Cl.³ H02P 5/34
U.S. Cl. 318—803 24 Claims



1. A system for controlling power supplied to an AC load from an AC source, comprising:

(a) at least two substantially identical supply channels separately coupled in parallel to said load, each of said supply channels including an AC to DC source side converter coupled from an AC source to a DC to AC load side converter via a DC link circuit, and wherein said load side converter of each channel supplies respective AC power of varying magnitude and frequency to said load;

(b) a channel control means, associated with each of said supply channels, capable of controlling the operation of the associated one of said supply channels;

(c) means for cross coupling said channel control means for balancing the operation of said supply channels; and,

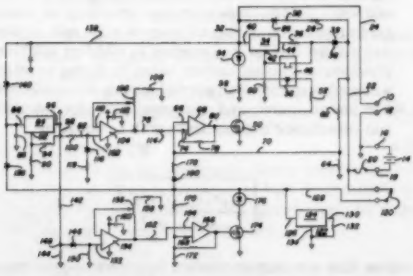
(d) means for limiting the effect of said cross-coupling whereby in the event of failure of a one of said supply channels, any remaining channels will continue to supply power to the load.

4,426,612

BATTERY CHARGING AND TESTING CIRCUIT

Michael F. Wicnienski, Antioch, and Donald E. Charles, Lake Zurick, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 16, 1982, Ser. No. 369,038
Int. Cl.³ H02J 7/10
U.S. Cl. 320—39 24 Claims



1. A constant current battery charging circuit, which comprises:

an input voltage source;

a trickle charge circuit coupled between said input voltage source and a battery to be charged;

a full charge circuit coupled between said input voltage source and the battery to be charged;

said full charge circuit including means for providing a constant current;

means for controlling said constant current means;

means for sensing the voltage of the battery;

means for providing a reference voltage;

an operational amplifier for comparing the sensed battery voltage with the reference voltage;

means for operating said controlling means in response to said operational amplifier, whereby said full charge circuit will be inoperative and said trickle charge circuit will be operative when the battery voltage is above a threshold;

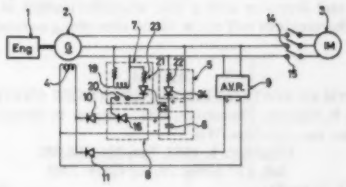
means for testing the battery condition including a separate test circuit having means for providing a reference voltage, means for sensing the battery voltage, means for comparing the sensed battery voltage with the reference voltage, and means for indicating a selected battery condition in response to said comparing means.

4,426,613

CONTROL SYSTEM FOR A SELF-EXCITED ALTERNATING CURRENT GENERATOR

Masamitsu Mizuno, Toba; Kazuomi Itoh, and Masahiro Urushibara, both of Ashikaga, all of Japan, assignors to Hokuetsu Industries Co., Ltd., Niigata, Japan

Filed Mar. 23, 1983, Ser. No. 478,627
Int. Cl.³ H02P 9/10, 9/14
U.S. Cl. 322—21 8 Claims



1. In a control system for a self-excited alternating current generator including an automatic voltage regulator which extracts part of a generator output and supplied rectified current to a field winding of said generator or an exciter equipped with said generator so as to energize said field winding, said control system comprising:

a fly-wheel capacitor connected through a rectifier to the output of said generator and normally charged by part of the output of said generator;

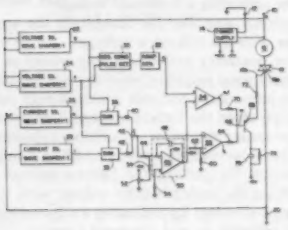
a detection circuit provided at the output of said generator and adapted to detect a drop of the output terminal voltage caused by a load current at the output of said generator in a value larger than a predetermined value and adapted to detect the recovery of said output terminal voltage; and

a field current control circuit adapted to close a circuit for connecting said fly-wheel capacitor to said field winding in parallel to said automatic voltage regulator when said detection circuit detects a drop of the output terminal voltage of said generator, and adapted to open said circuit for connecting said fly-wheel capacitor to said field winding when said detection circuit detects the recovery of the generator output terminal voltage, whereby electric energy stored in said fly-wheel capacitor is discharged to said field winding for supplying a field current in a value several times larger than a normal field current value when said detection circuit detects the drop of the output terminal voltage of said generator, thereby said voltage drop of the output terminal of said generator is recovered.

4,426,614
PULSED THYRISTOR TRIGGER CONTROL CIRCUIT

Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 30, 1981, Ser. No. 325,932
Int. Cl.³ H02P 5/40
U.S. Cl. 323—243 **9 Claims**

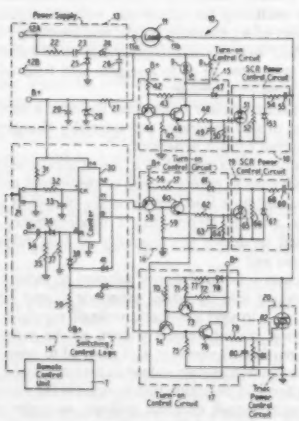


1. A thyristor control system for an alternating current input to a load which produces a difference in phase between the load current and voltage waveforms and comprising a thyristor for controlling the current flow through the load, the improvement comprising pulse producing means for producing firing pulses for firing said thyristor the duration of which is short relative to the duration of the alternating current half cycle and is independent of the load, means for deriving a control signal for said thyristor based on the phase difference between the load current and voltage, and means responsive to said control signal for inhibiting production of a firing pulse for firing said thyristor until a time when no current is flowing from the previous half cycle of the alternating current input.

4,426,615
SOLID STATE ELECTRONIC POWER SWITCH

James R. Hannas, Thiensville, Wis., assignor to Draco Laboratories, Inc., Grafton, Wis.

Filed Sep. 9, 1981, Ser. No. 300,489
Int. Cl.³ G05B 24/02; G05F 1/46
U.S. Cl. 323—322 **10 Claims**

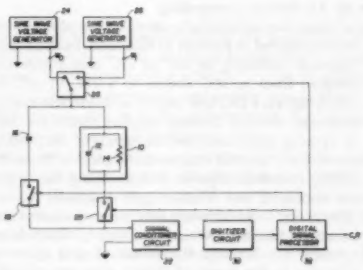


1. A solid state electronic fan power switch for controlling power delivered to a fan from a power source, comprising: a control switch; switching logic means connected to the control switch for changing an output state of the logic means when the control switch is activated; a plurality of power control circuits connected in parallel relative to one another and each forming with the fan a series circuit across the power source; each of the power control circuits including a semiconductor power switching element triggerable by a gate; at least one of the power control circuits having a capacitor for power reduction connected in series with the fan and power switching element; associated with each power control circuit a turn-on control circuit means connected to the gate of the switching element for initially turning on the switching element in response to a signal from the switching logic means when a voltage across the switching element is less than 10% of a peak-to-peak voltage which appears across the switching element prior to turn-on; and said turn-on control circuit means only sensing voltage directly across the power switching element, rectifying the sensed voltage, and directly comparing the sensed voltage to a voltage at an output of the switching logic means.

4,426,616
CAPACITIVE MEASUREMENT SYSTEM

Lawrence C. Maier, New Haven, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Oct. 6, 1981, Ser. No. 309,313
Int. Cl.³ G01R 27/00
U.S. Cl. 324—57 R **7 Claims**



1. A system for measuring the capacitance C of a capacitor independently of the resistance R of a resistor connected in parallel with said capacitor, which comprises:

a first source of alternating sinusoidal voltage of a first frequency W_0;

a second source of alternating sinusoidal voltage of a different second frequency W_1;

switch means for alternatively connecting said capacitor and parallel resistor to said first and second sources during successive intervals;

current measurement means for providing average values of current supplied to said capacitor and parallel resistor, said current measurement means providing an average current value N_0 during an interval with said capacitor and parallel resistor is connected to said first source and providing an average current value N_1 during an interval when said capacitor and parallel resistor are connected to said second source; and computer means for calculating said capacitance in accordance with an equation

$$C = \sqrt{\frac{(K_1N_1)^2 - (K_0N_0)^2}{W_1^2 - W_0^2}}$$

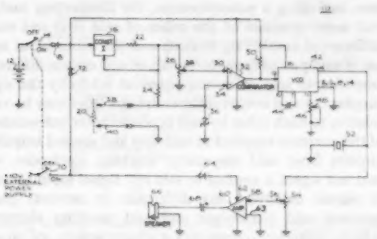
where K_0 is a multiplier constant for converting the current value N_0 to an admittance value $(W_0C)^2+1/R^2$, and K_1 is a multiplier constant for converting the current value N_1 to an admittance value $(W_1C)^2+1/R^2$.

4,426,617

AUDIBLE TEST DEVICE

Lester L. Forrester, Cucamonga, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Jun. 16, 1982, Ser. No. 388,821
Int. Cl.³ G01R 27/02, 19/14
U.S. Cl. 324—62 12 Claims



1. A test device for providing an audible tone when the resistance of a circuit path being tested is less than a selectable preset resistance value comprising:

a first source of voltage;

constant current source means selectively responsive to said first source of voltage for generating a current;

means for directing a first portion of said current to a first path;

adjustable means in said first path for generating a first voltage proportional to said first current portion and representing said preset resistance value;

means for directing a second portion of said current to a second path which includes said test resistance, a second voltage proportional to said second current portion being developed across said test resistance;

means for comparing said first and second voltages and generating an output signal when and only when said first voltage is greater than said second voltage; and

means responsive to said output signal for generating an audible tone, said audible tone being generated only when said test resistance is less than said preset resistance value.

4,426,618

PROBE FOR THE CONTINUOUS IN-SITU MEASUREMENT OF THE CORROSION RATE OF PIPES AT HIGH TEMPERATURE OR HAVING HIGH-RESISTIVITY LIQUIDS FLOWING THERETHROUGH

Camillo Ronchetti, Milan; Pierantonio Borroni, Bussero, and Giovanni Buzzanca, Bergamo, all of Italy, assignors to C.I.S.E. SpA, Italy

Filed Oct. 27, 1981, Ser. No. 315,391
Claims priority, application Italy, Nov. 4, 1980, 25758 A/80
Int. Cl.³ G01R 27/02
U.S. Cl. 324—65 CR 4 Claims

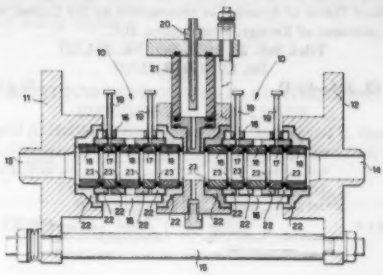
1. A probe for the continuous in-situ measurement of the corrosion rate of pipes subjected to high temperatures or having highly-resistive fluids flowing therethrough, by measuring the polarization resistance comprising

a section of pipe,

means to mount said section of pipe at the ends and in a path receiving therethrough at least some of the flow of the pipes whose measurement of corrosion rate is being made, said section of pipe including

a couple of electrodes of a tubular shape, one of which is the working electrode,

dielectric spacers alternately spacing apart said electrodes,



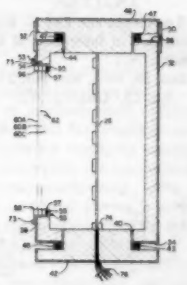
and resilient and nearly resilient gaskets to provide a tight seal between said electrodes, spacers, mounting means, and pipes.

4,426,619

ELECTRICAL TESTING SYSTEM INCLUDING PLASTIC WINDOW TEST CHAMBER AND METHOD OF USING SAME

Erhart E. Demand, Boston, Mass., assignor to Temptronic Corporation, Newton, Mass.

Filed Jun. 3, 1981, Ser. No. 269,868
Int. Cl.³ G01R 15/12
U.S. Cl. 324—73 PC 8 Claims



1. A system for electrically testing an electrical component under temperature controlled conditions, said system comprising, in combination:

a chamber adapted to maintain a temperature controlled environment;

a window defining at least a part of said chamber and comprising a plurality of flexible, juxtaposed, substantially transparent plastic sheets each mounted so that said sheets are substantially taut and adjacent sheets have a spacing therebetween;

means cooperating with the chamber for forcing a dry gas through each of said spacings between adjacent sheets so as to prevent moisture from condensing on said sheets;

means disposed in said chamber for mounting said component in said chamber adjacent said window; and

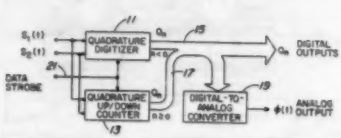
probe means including a probe needle adapted to be pushed from a position outside said chamber, through said window puncturing said sheets, into contact with said component, without appreciably affecting the temperature within said chamber.

4,426,620

ANALOG QUADRATURE SIGNAL TO PHASE ANGLE DATA CONVERSION BY A QUADRATURE DIGITIZER AND QUADRATURE COUNTER

C. Jerald Buchenauer, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 23, 1981, Ser. No. 304,737
Int. Cl.³ G01R *25/00*
U.S. Cl. 324—83 D **31 Claims**



1. An apparatus for deriving and digitally encoding the quadrature phase angle $\phi(t)$ of a pair of quadrature signals $S_1(t)$ and $S_2(t)$ where $S_1(t)=k(t)\sin\phi(t)$ and $S_2(t)=k(t)\cos\phi(t)$ and k(t) is a signal common to the pair of quadrature signals, said apparatus comprising:

quadrature digitizing means receiving $S_1(t)$ and $S_2(t)$ for real time generation of a signal indicating in binary format the fractional rotation excursions of $\phi(t)$; and

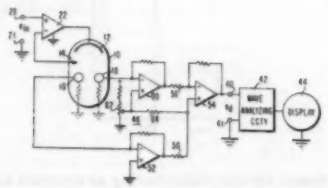
quadrature up/down counting means receiving $S_1(t)$; and $S_2(t)$ for real time generation of a signal indicating in binary format the number of full rotation excursions of $\phi(t)$.

4,426,621

DETECTION CIRCUITRY FOR ELECTROCHEMICAL ANALYSIS

Ronald K. Galwey, Los Gatos, and Kay K. Kanazawa, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,801
Int. Cl.³ G01N *27/02*
U.S. Cl. 324—439 **2 Claims**



1. In combination, an electrochemical cell having a receptacle for electrolyte, electrodes arranged in said electrolyte including:

a counter electrode, a reference electrode, and two working electrodes;

a pair of test signal input terminals, one of which is connected to a fixed reference potential;

an input differential amplifier circuit having an output connected to said counter electrode, one input connected to said reference electrode, and another input connected to said other test signal input terminal;

a signal detection circuit including:

first and second differential amplifying circuits each having a first input terminal, a second input terminal and an output terminal;

an output differential amplifier having a pair of input terminals and an output terminal;

means connecting the output terminals of said first and second amplifying circuits to a different one of said pair of input terminals of said output differential amplifier;

means connecting said first input terminal of each said first and second differential amplifying circuit to a different said working electrode;

means connecting said second input terminal of one of said first and second amplifying circuits to said reference potential; and

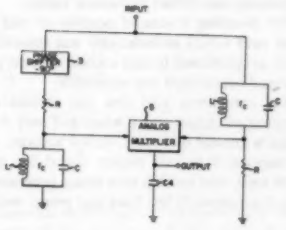
means, including a potentiometer, for connecting said second input terminal of the other of said first and second differential amplifying circuits and the other input terminal of said pair of input terminals of said output differential amplifier to said reference potential whereby the signals supplied to said output differential amplifier may be varied relative to each other by said potentiometer independently of the currents supplied to said first and second amplifying circuits from said respective working electrodes when said test signal is applied to said test signal input terminals to permit detecting any difference in currents passing between said electrolyte and said working electrodes, which difference represents a characteristic of an electroactive species in a test sample added to said electrolyte.

4,426,622

FREQUENCY DISCRIMINATOR

Otto E. Rittenbach, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 25, 1981, Ser. No. 296,026
Int. Cl.³ H03D *3/06*
U.S. Cl. 329—143 **12 Claims**



1. A frequency discriminator, comprising; an input terminal, means to connect said input terminal in parallel to a pair of channels, one of said channels comprising a 90° phase shifter and a frequency pass circuit in cascade and the other of said channels comprising a frequency stop circuit, said frequency pass circuit and frequency stop circuit both tuned to the same frequency, said frequency being the discriminator center frequency, means to apply the outputs of said two channels to an analog multiplier, and a low pass filter connected to the output of said analog multiplier.

4,426,623

RIPPLE FREE AMPLITUDE DEMODULATOR

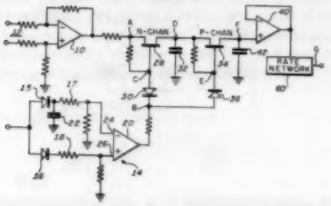
Dean R. Wilkens; Dan B. Harned, and Norman W. Hawn, all of Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 2, 1981, Ser. No. 279,899
Int. Cl.³ H03K *9/06, 9/00, 9/02*
U.S. Cl. 329—178 **10 Claims**

1. Amplitude demodulator of the type having an input means for applying a time varying signal thereto and having an output means, said demodulator comprising:

first sampling and holding means coupled to receive said time-varying signal for sampling and holding the amplitude of said time-varying signal in a first discrete time interval,

second sampling and holding means coupled to receive an output signal from said first sampling and holding means and for sampling and holding said output signal provided by said first sampling and holding means in a second discrete time interval and,



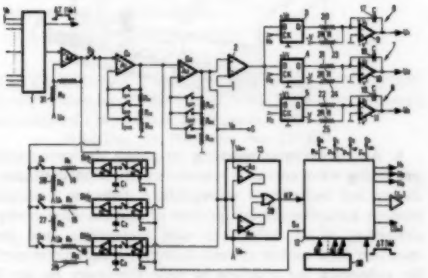
pulsing means responsive to said time-varying signal for activating said first and said second sampling and holding means in said first and said second discrete time intervals whereby the amplitude of said time-varying signal is detected and coupled to said output means from said second sampling and holding means.

4,426,624

DEVICE AND METHOD FOR AMPLIFYING AND SAMPLING MULTIPLEXED SIGNALS

Claude Beauducel, Henouville, and Jacques Cretin, Le Chesnay, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Compagnie Generale de Geophysique, Massy, both of, France

Filed Jul. 24, 1981, Ser. No. 286,323
Claims priority, application France, Jul. 25, 1980, 80 16550
Int. Cl.³ H03G *3/20*
U.S. Cl. 330—86 **16 Claims**



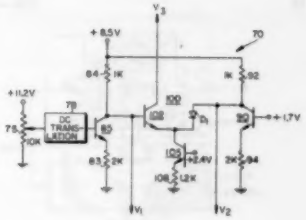
1. A device for amplifying and sampling multiplexed analog signals, comprising: a continuous amplification chain made up of plural serially interconnected amplification elements adapted for having their gains selectively varied to one of plural predetermined values by means of plural different feed back circuits arranged for being connected therewith by first switching means; memory means for memorizing amplified voltages from said amplification elements, and associated with second switching means for applying either the multiplexed analog signals or the memorized voltages to one of said amplification elements, and wherein said memory means comprises plural sample-and-hold means having their inputs permanently connected respectively to the respective outputs of said amplification elements of said amplification chain; and said device further comprising selecting means adapted for selecting the condition of said first and second switching means as a function of a comparison made by said selecting means between the output voltage of the continuous amplification chain and two reference voltages generated by said selecting means, said two reference voltages being respectively positive and negative, and said selecting means further adapted for controlling the operation of said first and second switching means, and of said sample-and-hold means, to give an optimum gain to the continuous amplification chain for amplifying the individual multiplexed analog signals.

4,426,625

CIRCUIT FOR LINEARLY GAIN CONTROLLING A DIFFERENTIAL AMPLIFIER

Leopold A. Harwood, Bridgewater, N.J., and Robert L. Shanley, II, Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 27, 1981, Ser. No. 296,865
Int. Cl.³ H03F *3/45*; H03G *3/30*
U.S. Cl. 330—254 **9 Claims**



1. Apparatus for controlling the gain of a differential amplifier having first and second control inputs, comprising:

a first source of supply potential;

a second source of supply potential;

a current steering network including

(a) a first transistor having a control electrode for controlling the current conducted in the main current conduction path of said first transistor;

(b) a semiconductor junction; and

(c) a source of predetermined current coupled to said current path of said first transistor and to said semiconductor junction for supplying current thereto;

first means for controlling the conduction of said first transistor current path, comprising

(a) a second transistor having a control electrode for controlling the conduction of the main current conduction path of said second transistor;

(b) first and second impedances; and wherein

(c) said first impedance, said conduction path of said second transistor, and said second impedance are connected in series in the order named, between said first and second sources of potential;

second means for controlling the conduction of said semiconductor junction, comprising

(a) a third transistor having a control electrode for controlling the conduction of the main current conduction path of said third transistor;

(b) third and fourth impedances; and wherein

(c) said third impedance, said conduction path of said third transistor, and said fourth impedance are connected in series in the order named, between said first and second sources of potential;

means for generating a variable voltage;

means for coupling said variable voltage to the control electrode of one of said second and third transistors;

means for coupling a substantially fixed DC voltage to the control electrode of the other one of said second and third transistors;

means for coupling a voltage developed by said first impedance to said control electrode of said first transistor at a first point;

means for coupling a voltage developed by said third impedance to said semiconductor junction at a second point, for developing a current through said semiconductor junction which varies substantially linearly as a function of said variable voltage; and

means for coupling voltages derived from said first and second points to said first and second control inputs of said differential amplifier, respectively.

4,426,626

SIGNAL SWITCHING CIRCUIT

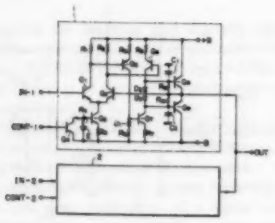
Yoshihiro Kawanabe, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 13, 1981, Ser. No. 282,693

Claims priority, application Japan, Jul. 14, 1980, 55-99046[U]

Int. Cl.³ H03F *3/26*

U.S. Cl. 330—267 **4 Claims**



1. In a signal switching circuit of the type comprising first and second output transistors coupled through an emitter follower arrangement to a common junction point, said output transistors having respective control electrodes connected to first and second sides of a plurality of series-connected diodes, a means far eliminating distortions produced by stray capacitances which exist between said respective control electrodes of said output transistors and ground during high frequency operations of said signal switching circuit, said stray capacitances producing said distortions by discharging through said diodes to render said diodes conductive, comprising:

a first by-pass impedance element having a linear voltage-current characteristic connected between said control electrode of said output transistor and said common junction point; and

a second by-pass impedance element having a linear voltage-current characteristic connected between said control electrrode of said second output transistor and said common junction point;

said by-pass impedances receiving said discharge of said stray capacitances and preventing said discharge from rendering said diodes conductive.

4,426,627

PHASE-LOCKED LOOP OSCILLATOR CIRCUIT UTILIZING A SUB-LOOP WITH A SECOND PHASE COMPARATOR

Akiyuki Yoshisato, and Sadao Igarashi, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

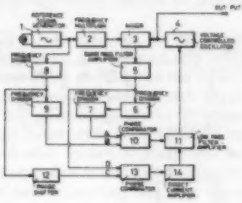
Filed May 11, 1981, Ser. No. 262,709

Claims priority, application Japan, May 10, 1980, 55-61960

Int. Cl.³ H03L *7/18, 7/22*

U.S. Cl. 331—12 **11 Claims**

1. A phase-locked loop oscillator circuit comprising a reference signal generator, a voltage-controlled oscillator, and a first phase comparator as well as a second phase comparator; means supplying said first phase comparator with an output of said reference signal generator whose frequency has been lowered and also an output of said voltage-controlled oscillator whose frequency has been lowered; means supplying said second phase comparator with a signal from said reference signal generator having a frequency higher than the signal applied to said first phase comparator from said reference signal generator and also a signal from said voltage-controlled oscillator having a frequency higher than the signal applied to



said first phase comparator from said voltage-controlled oscillator; and means for adding the outputs of said first and second phase comparators together to generate a composite control signal applied to said voltage-controlled oscillator.

4,426,628

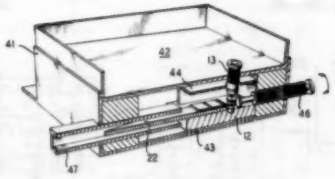
MILLIMETER WAVE OSCILLATOR WITH ENHANCED DIELECTRIC COUPLER

Edmund E. Malecki, Rumson, and Harold Jacobs, West Long Beach, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 23, 1981, Ser. No. 246,511

Int. Cl.³ H03B *7/14, 9/14*

U.S. Cl. 331—96 **12 Claims**



1. An oscillator comprising an active device capable of producing wave energy, a resonant cavity-formed around said device and including a waveguide, a dielectric transmission medium extending from a portion of said resonant cavity for delivering wave energy to said waveguide, and means mounted on a surface of said dielectric transmission medium for enhancing the coupling of radio frequency energy from said cavity into said dielectric transmission medium to facilitate power transfer and impedance matching between said resonant cavity and said dielectric transmission medium to increase the output power delivered in a first direction to said waveguide, said means for enhancing the coupling including a plurality of parallel metallic stripes spaced apart on said dielectric medium and electrically insulated from each other and displaced therealong in said first direction.

4,426,629

TWO-DIMENSIONAL KERNEL GENERATOR FOR TRANSVERSAL FILTERS

Scott D. Fouse, Canoga Park, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 24, 1981, Ser. No. 334,109

Int. Cl.³ H03H *15/02;* **G11C** *19/14;* **H01L** *27/00*

U.S. Cl. 333—165 **19 Claims**

1. A charge transfer device formed on a semiconductive

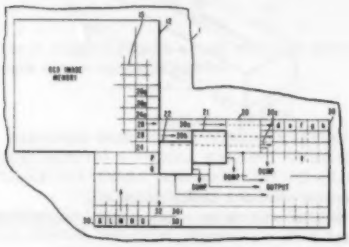
substrate for generating two dimensional kernels having dimensions N by M, comprising:

a memory array storing a plurality of data in the form of charge packets, said array being organized by rows and columns of said data;

a first plurality of N parallel charge transfer registers and a second plurality of N−1 parallel charge transfer registers which are parallel with said first plurality of registers;

means for transferring one set of N of said rows of memory data through said first plurality of N parallel registers;

means for transferring another set of N−1 of said rows of memory data through said second plurality of N−1 parallel registers in parallel with said one set of N parallel memory data rows simultaneously;



means for recirculating N−1 of said N rows of said one data from corresponding ones of said first plurality of N parallel registers to said second plurality of N−1 parallel registers; and

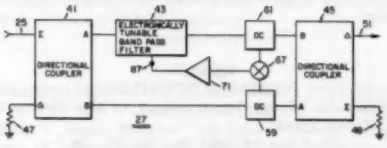
means for sensing M arrays of data in said first and second plurality of parallel registers, each of said arrays comprising M columns and N rows of data, each of said arrays being offset from an adjacent array by M columns in a direction parallel to said rows and by one row in a direction parallel to said columns.

4,426,630

ELECTRONICALLY TUNABLE BAND REJECT FILTER

Andrew F. Folkmann, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 28, 1981, Ser. No. 334,957
Int. Cl.³ H03H *7/12, 11/04;* H01P *1/20*
U.S. Cl. 333—174 **12 Claims**



1. A band reject filter comprising:

a first directional coupler means for sampling an input signal to obtain a first sampled signal and a second sampled signal;

bandpass filter means having a center frequency and coupled to receive said first sampled signal and provide a filtered first sampled signal having only frequencies in a bandwidth about said center frequency, said bandpass filter means including means responsive to a control signal for varying the center frequency of said bandpass filter means;

a second directional coupler means coupled to provide an output of the difference between the filtered first sampled signal and the second sampled signal as a band reject filter output;

first sensor means for sensing said filtered first sampled signal to obtain a first sensed signal;

second sensor means for sensing the second sampled signal to obtain a second sensed signal; and

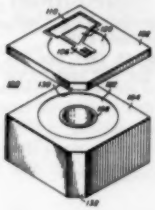
means responsive to said first sensed signal and said second sensed signal for providing an output, said output being coupled as the control signal to said bandpass filter means for varying the center frequency.

4,426,631

CERAMIC BANDSTOP FILTER

Robert F. D'Avello, Schaumburg, and Raymond L. Sokola, Lake Zurich, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 16, 1982, Ser. No. 349,347
Int. Cl.³ H01P *1/202, 1/205, 7/04*
U.S. Cl. 333—202 **41 Claims**



1. A bandstop filter comprising:

first means comprised of a dielectric material and having top and bottom surfaces, said first dielectric means further including electrode means comprised of a conductive material disposed on the top surface;

second means comprised of a dielectric material and having top and bottom surfaces, said second dielectric means further including a hole extending from the top surface to the bottom surface thereof, and said second dielectric means further being covered entirely with a conductive material with the exception of the top surface; and

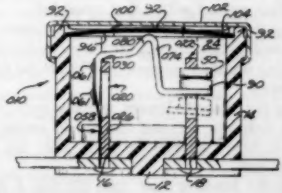
means for attaching the bottom surface of the first dielectric means to the top surface of the second dielectric means so that the electrode means on the top surface of the first dielectric means is arranged substantially opposite to the hole in the second dielectric means.

4,426,632

SNAP-ACTING THERMOSTATIC SWITCH USING INFLEXIBLE, SPRING BIASED CONTACT ARM

Henry J. Boulanger, Nicholasville, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 26, 1982, Ser. No. 411,747
Int. Cl.³ H01H *37/12*
U.S. Cl. 337—347 **14 Claims**



1. An electrical switch comprising a housing forming a

switch cavity therein, the housing having an open end, a snap-action disc disposed at the open end,

a stationary electrical contact mounted in the switch cavity,

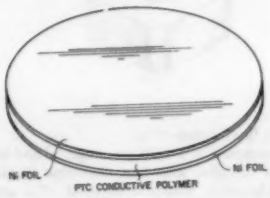
movable electrical contact means mounted in the switch cavity and having a movable electrical contact adapted to move into and out of engagement with the stationary electrical contact, the movable electrical contact means includes a plate member having a distal end portion disposed in the switch cavity and mounting thereon a relatively inflexible, movable contact arm portion and low spring rate biasing means adapted to place a bias on the movable contact arm portion, the biasing means includes a spring detachably connected to the plate member and the movable contact arm and motion transfer means mounted in the housing and adapted to transfer motion from the snap-action disc to the movable electrical contact means.

4,426,633

DEVICES CONTAINING PTC CONDUCTIVE POLYMER COMPOSITIONS

James M. Taylor, Mountain View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 15, 1981, Ser. No. 254,352
Int. Cl.³ H01C *3/04*
U.S. Cl. 338—25 **13 Claims**



1. A method of making an electrical circuit protection device which comprises

(a) a laminar PTC element composed of a melt-extruded conductive polymer composition which exhibits PTC behavior, which has a resistivity at 23° C. of less than 100 ohm.cm, and which comprises

(i) a polymer component which comprises at least one crystalline polymer and

(ii) a particulate conductive filler which is dispersed in said polymer component;

(b) a first laminar electrode which is adherent to one face of the PTC element and which is a metal foil; and

(c) a second electrode which is adherent to the opposite face of the PTC element and which is a metal foil;

said first and second electrodes being connectable to a source of electrical power and, when so connected, causing current to flow through said element; which method comprises

(1) melt-extruding said conductive polymer composition into a continuous, laminar shaped element;

(2) bringing one face of the shaped element from step (1) into face-to-face contact with a first metal foil;

(3) bringing the other face of the shaped element from step (1) into face-to-face contact with a second metal foil;

(4) subjecting the shape element and the metal foils to heat and pressure;

(5) cooling the shaped element and the metal foils while exerting sufficient pressure thereon to ensure that they remain in firmly adherent contact after the cooling is complete; and

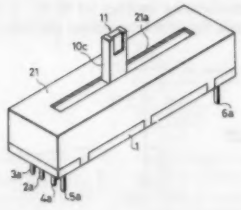
(6) cutting the laminate from step (5) into a plurality of circuit protection devices each of which has a maximum dimension of less than 2 inches and a resistance at 23° C. of less than 100 ohms.

4,426,634

VARIABLE RESISTANCE DEVICE

Tsutae Okuya, and Yoshiyuki Ito, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 372,199
Claims priority, application Japan, Apr. 28, 1981, 56-62009[U]
Int. Cl.³ H01C *10/30*
U.S. Cl. 338—161 **13 Claims**



1. A variable resistance device comprising

a case member with an open bottom and a longitudinal slot formed at the top thereof;

an insulating substrate attached to said case member at said open bottom so as to define a hollow case;

resistance and collector elements formed on said substrate so as to extend parallel to each other and to said slot;

common conductor means extending on said substrate parallel to said resistance and said collector elements;

first and second change-over conductor elements disposed on said substrate and extending parallel to said common conductor means;

a slide member made of an insulating material and disposed within said case, said slide member being provided with operating means extending upward and outward through said slot and slidable along said substrate;

a contactor attached to said slide member for making sliding contact with said resistance and said collector elements and bridging between them;

first and second change-over contactors attached to said slide member for slidably engaging with said common conductor and one of said change-over conductors, respectively; and

a pair of polar light source means disposed within said operating means and connected in series between said change-over conductors, said polar light source means being connected in parallel and in opposite polarity with each other.

4,426,635

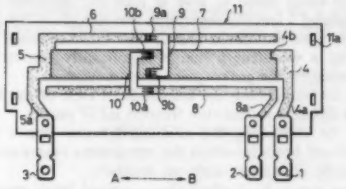
VARIABLE RESISTOR

Keiji Takezawa, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1981, Ser. No. 301,206
Claims priority, application Japan, Sep. 13, 1980, 55-130830
Int. Cl.³ H01C *10/44*
U.S. Cl. 338—183 **5 Claims**

1. A variable resistor comprising: an insulating substrate; a resistance member formed on said insulating substrate and connected to first and third terminals through respective electrodes; a collector formed on said insulating substrate in parallel with said resistance member and connected at its one end to a second terminal; a conductor formed on said insulating substrate and extending in parallel with said resistance member over the entire length of said resistance member from the electrode connected to one end of said resistance member; and first and second sliders carried by a common slider carrier, said first slider having contacts adapted to slide on said resistance

member and said conductor, while said second slider having contacts adapted to slide on said resistance member and said



collector at the same position on said resistance member along the length of said resistance member.

4,426,636

METHOD FOR PREVENTING WAVEFORM DISTORTION OF A SIGNAL PASSING THROUGH AN INSULATED CONDUCTOR AND CIRCUIT ELEMENT EMBODYING THE METHOD

Kazuho Ohta, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jul. 23, 1980, Ser. No. 171,316

Claims priority, application Japan, Jul. 23, 1979, 54-101687[U]

Int. Cl.³ H01C *1/012*

U.S. Cl. 338—314 **10 Claims**

1. An electrical circuit element having at least one conductor adapted for passing audio signals therethrough, said circuit element being covered with a layer of an insulating material, comprising a layer of a carbon-containing material having a volume resistivity higher than the volume resistivity of said conductor and lower than the volume resistivity of said insulating material and surrounding and intimately contacting the outer surface of said layer of insulating material, said carbon-containing material partially penetrating into said layer of insulating material to provide a gradual variation of dielectric constant in the transverse cross-section of said layer of insulating material toward the outer surface thereof and making no electric contact with said conductor.

4,426,637

COMBINATION ENCODER-DECODER INTEGRATED CIRCUIT DEVICE

William C. Apple, Brighton, and Keith D. Jacob, Ann Arbor, both of Mich., assignors to Multi-Elmac Company, Novi, Mich.

Division of Ser. No. 15,495, Feb. 26, 1979, Pat. No. 4,305,060. This application Mar. 9, 1981, Ser. No. 241,820

Int. Cl.³ H04Q *9/00;* **H04B** *7/00*

U.S. Cl. 340—825.65 **14 Claims**

1. A dual purpose integrated circuit device for both encoding and decoding digital electrical signals, said device comprising:

a plurality of input/output ports for making electrical connections between external circuitry and internal portions of the device, said device portions including:

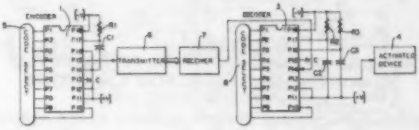
generator means for providing a series of encoded digital words in which the bits thereof are formed in accordance with a preselected code;

means for connecting the output of said generator means to a first output port for transmitting said words to a receiver/encoder;

comparator means for comparing signals applied at its inputs and providing an output as a function thereof;

means for also coupling the output of said generator means to an input of said comparator means whereby to provide local code words;

means for coupling a first input port for receipt of received code words to another input of said comparator means;



means for coupling the output of said comparator means to a second output port for activating an external load depending upon the comparison between the received and local code words; and

whereby said device may be utilized either as an encoder or decoder by changing the external connections to the input/output ports of the device, with said same generator means being utilized to generate the transmitted digital words in the encoder mode and to generate the local code for comparison with the received code in the decoder mode.

4,426,638

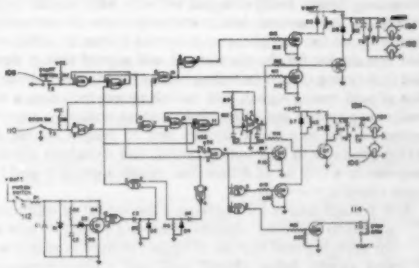
FLASHER FOR VEHICLE LIGHTS

Robert Donley, 2291 Picket Post La., Columbus, Ohio 43220, and Terry Dawson, 1367 Crestview St., Reynoldsburg, Ohio 43068

Continuation-in-part of Ser. No. 262,200, May 8, 1981, Pat. No. 4,368,349. This application Oct. 26, 1981, Ser. No. 315,174

Int. Cl.³ B60Q *1/26*

U.S. Cl. 340—74 **8 Claims**

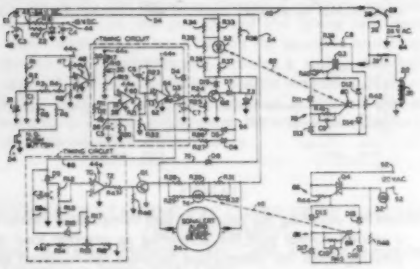


1. A controller for operating vehicle signal lights of the type that include a set of amber warning lights and a set of red stop lights, said controller comprising, in combination, an amber alternating relay in circuit with the amber lights for flashing same; a red alternating relay in circuit with the red lights for flashing same; an amber light control circuit for energizing and deenergizing said amber alternating relay and for delivering timed pulses to said alternating relay; a start switch for energizing said amber light control circuit; a red light control circuit for energizing and deenergizing said red alternating relay and for delivering timed pulses to said amber alternating relay, said red light control circuit being connected to said amber light control circuit for deenergizing said amber alternating relay; and a door switch for energizing and deenergizing said red light control circuit.

4,426,639
TIMING APPARATUS

Frank L. Jessup, New Whiteland, Ind., assignor to Robert S. Kaiser, Marlboro, N.J.

Filed Sep. 1, 1981, Ser. No. 298,499
Int. Cl.³ G08B *23/00*; E05F *15/20*
U.S. Cl. 340—528 **7 Claims**



1. Timing apparatus comprising switch means operable to produce a switching signal, a first energizing means coupled to said switch means responsive to said switching signal for producing a first signal, a first electrically energizeable device coupled to said first energizing means and being energizeable in response to said first signal, a first timing circuit coupled to said first energizing means and responsive to said first signal to generate a first timing signal of predetermined duration and corresponding to said switching signal, said first energizing means being further responsive to said first timing signal thereby to remain in the state of providing said first signal for said predetermined duration, a second timing circuit coupled to said first timing circuit and responsive to the termination of said first timing signal to produce a second timing signal of second predetermined duration, and a second energizing means coupled between said second timing circuit and said device and responsive to said second timing signal for retaining said first device energized for said second predetermined duration, a second electrically energizeable device, said second energizing means being coupled between said second timing circuit and said second device and responsive to said second timing signal for energizing said second device in addition to said first device for the duration of said second timing signal, said first timing circuit including means for adjusting the duration of said timing signal, said switch means including a normally open switch and a first binary output voltage-comparing means having two input circuits and an output circuit and which produces in said output circuit said switching signal in response to a first set of differential signals applied to said two input circuits; respectively,

first voltage means for applying a second set of differential signals to said input circuits when said switch is open and for applying said first set of signals thereto in response to said switch being closed, and said voltage-comparing means terminating said switching signal in response to said second set of signals.

4,426,640
LASER SCANNING APPARATUS

Jack K. Becconsall, Appleton; John H. W. Cramp, Lymm; Robert F. Reid, Beechwood; Reginald C. Moore, Harpenden; Barry J. Rye, Cottingham, and Eric L. Thomas, Cherry Burton, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sep. 5, 1980, Ser. No. 184,259
Claims priority, application United Kingdom, Sep. 5, 1979, 7930707
Int. Cl.³ G08B *17/10*
U.S. Cl. 340—632 **16 Claims**

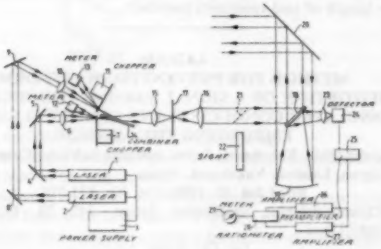
1. Apparatus for remote quantitative monitoring of one or more selected gases in a gaseous environment which comprises:

laser sources for generating electromagnetic radiation capable of being tuned to give at least one detection beam containing a specific absorption wavelength of the gas or gases to be monitored and at least one reference beam having a wavelength that is significantly less strongly absorbed by the gas or gases to be monitored,

means for modulating the amplitude of each of the beams with different modulation frequencies or phases,

means for combining the modulated beams into a single combined beam in which the component beams are substantially coincident with one another,

scanning means to displace the combined beam angularly through the gaseous environment so as to direct the beam



towards a plurality of locations sequentially and repetitively,

means for collecting at least a portion of the radiation which is returned from each of the locations,

a detector for deriving electrical signals corresponding to the intensity of the collected radiation,

means for isolating the electrical signals corresponding to the intensity of the radiation having the aforesaid modulation frequencies or phases,

means for obtaining the ratio of the isolated signals corresponding to radiation collected from a detection beam and a related reference beam thereby to provide a measure of the amount of the selected gas or gases in each beam path traversed between the apparatus and the scanned locations, and

means for indicating the amount of gas detected.

4,426,641
METHOD AND APPARATUS FOR MONITORING THE SHAFT VIBRATION OF A ROTARY MACHINE

Nobuo Kurihara; Yasuo Morooka; Mitsuyo Nishikawa; Kiyoshi Miura, and Yoshitoshi Nagahashi, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 31, 1981, Ser. No. 249,469
Claims priority, application Japan, Mar. 31, 1980, 55-43040; Nov. 7, 1980, 55-155988
Int. Cl.³ G08B *23/00*
U.S. Cl. 340—683 **8 Claims**

1. A method of monitoring a shaft vibration of a rotary machine comprising the steps of:

detecting the shaft vibration as a wave signal in proportion to a rotational frequency of the rotary machine;

filtering the detected shaft vibration signal;

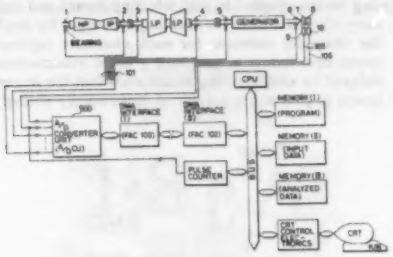
sampling the filtered signal at a predetermined frequency, the predetermined frequency being selected by;

(a) selecting the number of waves of the filtered signal to be included in an analyzing time interval determined by at least a minimum fractional harmonic of the rotational frequency which exists in a frequency range to be monitored,

(b) selecting the number of samples to be sampled from the filtered signal in the analyzing time interval in accordance

with a ratio of a maximum higher harmonic of the rotational frequency to the minimum fractional harmonic of the rotational frequency in the frequency range to be monitored, and

(c) multiplying the rotational frequency by a ratio of the selected number of samples to the selected number of



waves with the product thereof being the predetermined frequency; and

analyzing the sampled data to obtain the vibration amplitude of frequency components within the frequency range to be monitored by digital processing so as to monitor the shaft of vibration state of the rotary machine.

4,426,642

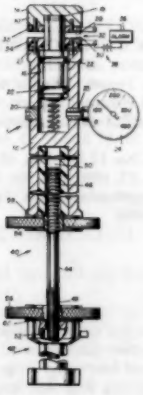
MINE ALERT DEVICE

Perry S. Poffenbarger, Charleston, W. Va., assignor to John Wade Bell, Webster Springs and Harold R. Haynes, Charleston, both of, W. Va., part interest to each

Filed Oct. 7, 1981, Ser. No. 309,404

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—690 **16 Claims**



1. A mine alert device comprising:

surface-engaging means for engaging at least one of a plurality of surfaces defining an underground mine;

means defining a chamber in which a compressible medium is enclosed;

a plunger connected between said surface-engaging means and said chamber-defining means, said plunger slidably engaged with said chamber at one end thereof in contact with said compressible medium therein so that said plunger moves in response to a compression force applied to said surface-engaging means and applies pressure on said compressible medium;

switch means for actuating an alarm in response to a predetermined amount of movement between said surface-engaging means and said chamber-defining means; and

visual means operatively associated with said compressible medium for establishing said predetermined amount of movement between said surface-engaging means and said chamber defining means required for said switch means to actuate the alarm.

4,426,643

ELECTROLYTIC APPARATUS HAVING A STABLE REFERENCE ELECTRODE AND METHOD OF OPERATING SUCH APPARATUS

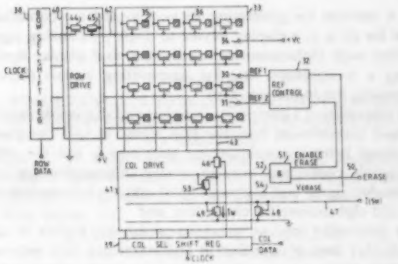
David H. Martin, Eastleigh, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,268

Claims priority, application European Pat. Off., Jun. 30, 1980, 80302193.0

Int. Cl.³ G07G *3/34*

U.S. Cl. 340—713 **5 Claims**



1. An apparatus for use with a source of electric current and an electrochromic cell having a working electrode, a first reference electrode for sensing the potential of the cell and drive means for depositing material on and removing material from the working electrode, said apparatus comprising

first switching means for connecting the first reference electrode to a first source of electric current to cause deposition of material on the first reference electrode,

second switching means for connecting the first reference electrode to the drive means to provide an indication of the cell potential,

a second reference electrode in said cell, said second electrode adapted to serve as an alternate for the first reference electrode in sensing the potential of the cell, said second electrode adapted to serve as a control during the potentiostatic erasure of the first reference electrode,

third switching means for connecting said second reference electrode to a first source of electric current to cause deposition of material on the second reference electrode,

fourth switching means for connecting said second reference electrode to the drive means to provide an indication of the cell potential, and

reference means connected to said first and second switching means for controlling the deposition of material on the first reference electrode, said reference control means connected to said third and fourth switching means for controlling the deposition of material on said second reference electrode wherein said reference means causes alternate operation between said second and said fourth switching means so that only one of the reference electrodes is always connected to the drive means.

4,426,644

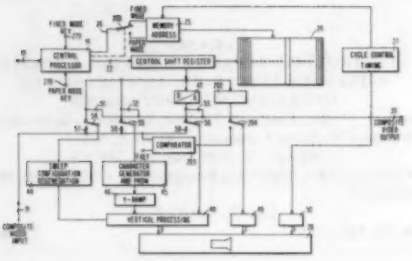
METHOD AND APPARATUS FOR GENERATING THREE COORDINATE SIGNALS X, Y, Z FOR AN X, Y, Z DISPLAY DEVICE

Leopold Neumann, Lexington; Richard B. Kline, II, Stoneham, and Richard H. McMorrow, Jr., Lincoln, all of Mass., assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,539

Int. Cl.³ G09G *1/00*

U.S. Cl. 340—720 **62 Claims**



1. A method for generating an x-, a y- and a z-coordinate signal for an x, y, z display device to display an analog signal together with alphanumerical characters, said display device having a transmission line for transmitting signals thereto, comprising the following steps:

(a) transmitting a composite signal to said display device via said transmission line, the first signal of said composite signal being a synchronizing start signal, and the other signals containing varying analog information for said analog signal and varying digital address information for said alphanumerical characters; and

(b) generating said x-, y- and z-coordinate signals in said display device such that in predetermined time intervals with reference to said synchronizing start signal and in predetermined varying combinations

(b1) for the display of said alphanumerical characters the x- and y-coordinate signals are developed and determined by said display device, whereas the remaining z-coordinate signal is developed by said display device, but is determined from said varying digital address information of said composite signal received via said transmission line; and

(b2) for the display of said analog signal the x-coordinate signal and a constant z-coordinate signal are developed and determined by said display device, whereas the remaining y-coordinate signal is developed by said display device, but is determined from said varying analog information of said composite signal received via said transmission line.

4,426,645

CHARACTER GENERATING SYSTEM

Yuki Sakai, Hino, and Hiroya Nakamura, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1981, Ser. No. 273,082

Claims priority, application Japan, Jun. 27, 1980, 55-86655

Int. Cl.³ G09G *1/16*

U.S. Cl. 340—724 **4 Claims**

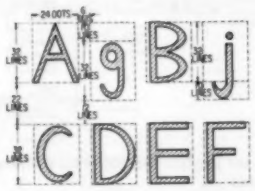
1. In a system for generating alphanumeric characters for display by electrical means in response to signals input to the system,

a primary character store in which each of the different characters are stored in an equally dimensioned coordinate matrix of discreet character elements,

a supplemental character store in which the lower descender portion of the lower case letter j is stored in a coordinate matrix of discreet character elements,

means coupled to the primary and supplemental character stores for selecting characters to be output for display by electrical means in response to the input signals and for causing the character element data to be generated by row in sequence for each selected character,

timing means coupled to said selecting means and said primary character store for enabling the output for display of the character elements for each character representing lower case letters g, p, q and y to be predeterminately delayed by said selecting means such that the lower case letters g, p, q and y appear as downwardly shifted with



respect to other characters normally output for display, and

decoding means coupled to the input signals and said selecting means for detecting the lower case letters g, p, q, y and j in the input signals and for causing said predetermined output delay upon detection of the lower case letters g, p, q and y and for causing, upon detection of the lower case letter j, the character elements thereof to be normally output from said primary character store and the character elements of the lower descender portion of the lower case letter j to be output immediately thereafter from said supplemental character store to complete a composite output for display of the lower case letter j.

4,426,646

SELF SHIFT TYPE GAS DISCHARGE PANEL, DRIVING SYSTEM

Hisashi Yamaguchi; Toyoshi Kawada, both of Kobe; Hirofumi Kashiwara, Kasai; Hiroyuki Ishizaki, Akashi, and Kenji Murase, Kakogawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 12,389, Feb. 15, 1979. This application Dec. 17, 1980, Ser. No. 217,387

Claims priority, application Japan, Feb. 16, 1978, 53-17199; Aug. 12, 1978, 53-98588

Int. Cl.³ G09G *3/28*

U.S. Cl. 340—769 **16 Claims**

1. A self shift type of gas discharge display system, comprising

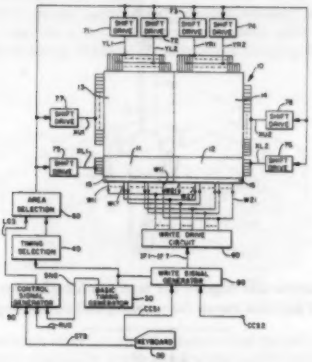
a discharge panel having at least four panel areas selectively aligned in rows and columns, wherein each of said four panel areas has two sides adjacent to respective sides of two others of said four panel areas, and two of said panel areas, corresponding to a first one of said rows of said panel areas, each have one side adjacent a first edge of said display panel,

a plurality of sets of shift channels, each said shift channel comprising a line of discharge cells defined by respective portions of electrodes separated by a discharge gap, and all the shift channels of each said set extending across all the panel areas of a respective one of said columns of panel areas,

a plurality of write cells, each said write cell being located at one end of a respective one of said shift channels along said first edge of said panel, for writing discharge spots into said shift channels,

said electrodes of said shift channels being divided into first and second plural sets of plural groups, all the electrodes

in each said group being electrically connected in common, each said first set of groups including electrodes in all the panel areas of a respective one of said rows of panel areas, and each said second set of groups including electrodes in all the panel areas of a respective one of said columns of panel areas, each said group of electrodes including electrodes from all the panel areas of the respective row or column of said panel areas,



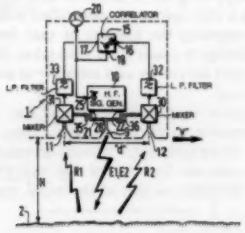
said system comprising operating means for applying respective waveforms to each said group of electrodes and to said write electrodes, for writing and shifting selected display data in the form of said discharge spots into said discharge cells of selected panel areas of said first row of panel areas, while displaying previously-written display data in other ones of said panel areas.

4,426,647

RADAR ARRANGEMENT FOR MEASURING VELOCITY OF AN OBJECT

Jean-Pierre Tomasi, Velizy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 9, 1981, Ser. No. 241,985
Claims priority, application France, Mar. 3, 1980, 80 04708
Int. Cl.³ G01S *13/58*
U.S. Cl. 343—8 **7 Claims**



1. A radar arrangement for measuring the velocity "v" of the arrangement relative to an object, said arrangement comprising:

(a) a signal generator for producing first and second frequency modulated signals shifted in time with respect to each other;

(b) transmitting means coupled to the signal generator for transmitting toward said object first and second frequency modulated waves corresponding to said first and second frequency modulated signals;

(c) first and second receiving aerials for receiving reflections of said transmitted waves from the object, said receiving aerials being arranged in line with the direction of motion of the arrangement and being separated by a distance "d";

(d) a first selection circuit coupled to the transmitting means and the first receiving aerial for producing a signal representative of the reflection of the first transmitted wave;

(e) a second selection circuit coupled to the transmitting means and the second receiving aerial for producing a signal representative of the reflection of the second transmitted wave;

(f) a correlator coupled to the first and second selection circuits and to the transmitting means, said correlator controlling the time shift of the frequency modulated waves transmitted by the transmitting means to a value τ for which correlation between signals of the same frequency produced by the selection circuits is a maximum; and

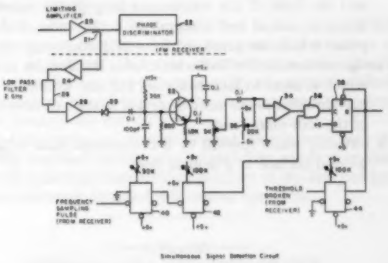
(g) means coupled to the correlator for determining the value of "v" in accordance with the relationship $v = d/\tau$.

4,426,648

SIMULTANEOUS SIGNAL DETECTION FOR IFM RECEIVERS BY DETECTING INTERMODULATION PRODUCTS

James B. Y. Tsui, Centerville, and Rudy L. Shaw, Huber Heights, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 9, 1981, Ser. No. 271,753
Int. Cl.³ G01S *7/36*; G01R *23/16*
U.S. Cl. 343—18 E **5 Claims**



1. In an instantaneous frequency measurement (IFM) receiver, the said receiver having receiving means including a limiting amplifier, which produces signals containing difference frequencies only if received pulses of different frequencies occur simultaneously, the improvement comprising:

a. a filtering means coupled to said limiting amplifier for blocking the passage of the principal signal frequencies coming from said limiting amplifier while passing low frequency difference frequencies;

b. detector means coupled to said filtering means detecting said difference frequencies and converting RF signals into video signals; and

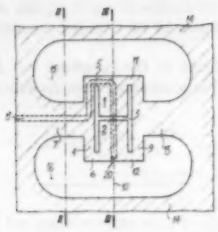
c. bistable means coupled to said detector means, said bistable means being set in response to said video signals, whereby the presence of simultaneous signals is flagged.

4,426,649

FOLDED BACK DOUBLET ANTENNA FOR VERY HIGH FREQUENCIES AND NETWORKS OF SUCH DOUBLETS

Gérard Dubost, and Claude J. Vinatier, both of Rennes, France, assignors to L'Etat Francais, represeate par le Secretaire d'Etat aux Postes et des a la Telediffusion (Centre National d'Etudes des Telecommunications), Issy-les-Moulineaux and Etablissement Public de Diffusion dit "Telediffusion de France", Montrouge, both of, France

Filed Jul. 20, 1981, Ser. No. 284,702
Claims priority, application France, Jul. 23, 1980, 80 16620
Int. Cl.³ H01Q 1/38, 9/26
U.S. Cl. 343—700 MS 5 Claims



1. A folded back doublet antenna for operating at very high frequencies, said doublet antenna comprising at least one printed circuit board having conductive areas thereon which provide:

feed means in the form of two symmetrical half-plates separated by an insulating cut;

folded back means which comprises first and second continuous long plates which are symmetrically positioned with respect to the longitudinal axis of symmetry of the two symmetrical half-plates and which are separated from the adjacent sides of the half-plates by an interval;

the common width of the two half-plates being appreciably more than the width of the continuous long plates (4, 9) and the ends of the continuous long plates respectively being joined to and integral with the ends of the half-plates which are removed from said insulating cut;

a triplate conductive line which feeds the doublet at a point which is close to said insulating cut and which has its end part directed in the same direction as the axis of symmetry of the half-plates and

a reflector plane formed by a continuous plate which is a ground surface of a triplate line.

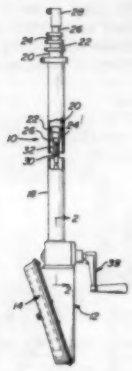
4,426,650

TAPE ERECTABLE ANTENNA MAST

Iverson Korsen, Dresher, Pa., assignor to American Electronic Laboratories, Inc., Lansdale, Pa.

Filed May 4, 1979, Ser. No. 35,888
Int. Cl.³ H01Q 1/10
U.S. Cl. 343—903 10 Claims

1. A tape erectable mast comprising a mast bottom containing a spool of semi-flexible tape, a plurality of telescoping tubes, said tape extending through said tubes and being connected to the tube with the smallest diameter, a tape guide extending into and generally along the axis of said tubes, means in contact with the tape between the spool and said tape guide for winding and unwinding the tape to thereby extend or retract the mast, said tape guide being rectangular in section, a pair of guide rollers, each guide roller being in rolling contact



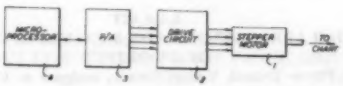
with a discrete side edge of the tape at a location between said tape guide and said means for winding and unwinding the tape.

4,426,651

STRIP CHART RECORDER

William C. Muellner, LaGrange, and Walter Hvostik, Berwyn, both of Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn

Filed Mar. 3, 1982, Ser. No. 354,406
Int. Cl.³ G01D 15/24
U.S. Cl. 346—136 3 Claims



1. A strip-chart recorder having means initiated by operator command for returning the strip-chart to the initial starting point of a scan without residual backlash comprising, in combination:

a pulse drive for driving said strip-chart;

means for supplying drive pulses to said motor, said means including a microprocessor controlled pulse drive circuit,

means for counting the number of said drive pulses, said means starting to count from zero when the pen contacting the chart driven by said motor is at an initial starting position; and

said drive pulse supplying means and said counter means being operative to effect a routine upon operator command, to drive said motor thereby to return said counter to zero count, the final part of said return being driven in the same direction as that of the initial approach to zero.

4,426,652

INK JET PRINTING APPARATUS

Masanori Horike, and Yutaka Ebi, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 13, 1981, Ser. No. 310,688
Claims priority, application Japan, Oct. 16, 1980, 55-144882
Int. Cl.³ G01D 15/18
U.S. Cl. 346—75 6 Claims

1. An ink jet printing apparatus comprising:

an ink ejection head for ejecting a jet of ink;

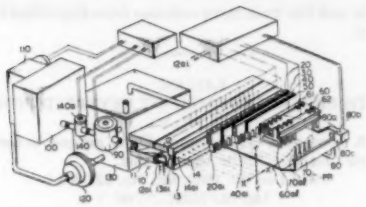
charging means for electrostatically and selectively charging ink droplets separated from the ink jet;

deflection means for electrostatically deflecting the charged ink jet;

deflection detecting means for detecting a deflection position when a reference charging voltage is applied to the ink jet; and

control means for controlling the deflection detecting means to adjust a voltage level which determines an amount of deflection of the ink jet such that the detected actual deflection position coincides with a predetermined reference deflection position;

the control means comprising charging voltage amplifying means having a controllable or adjustable gain, the voltage level being adjusted by selectively varying the gain in



accordance with the displacement of an actual deflection position relative to the reference deflection position

the voltage amplifying means comprising an amplifier element, the gain being controlled by varying an input impedance of the amplifier element by means of impedance selection means;

the impedance selection means comprising a plurality of resistors connected to an input of the amplifier element for determining a value of the input impedance of the amplifier element and a plurality of switching elements connected in series with the respective resistors for switchably selecting a combination of the resistors to thereby determine a desired value of the impedance.

4,426,653

PRINTING SYSTEM FOR FACSIMILE RECEPTION APPARATUS

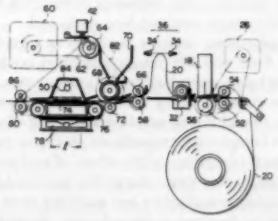
Kenya Komada, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 304,141

Claims priority, application Japan, Sep. 26, 1980, 55-135003

Int. Cl.³ G01D *15/06*; H04N *1/30*

U.S. Cl. 346—153.1 **14 Claims**



1. A facsimile printing system for printing received data in compressed form on a copy sheet, comprising:

first sheet feed means for intermittently feeding the copy sheet at a variable speed in accordance with the compressed data;

sheet detaining means for temporarily detaining the copy sheet which is fed by the first sheet feed means; and

second sheet feed means for feeding the copy sheet detained by the sheet detaining means by a predetermined amount at a predetermined speed after the amount of the copy sheet detained by the sheet detaining means reaches a predetermined value;

said predetermined amount being selected such that the sheet detaining means and the second sheet feed means operate on the copy sheet a plurality of times for incrementally feeding the copy sheet.

4,426,654

ION MODULATING ELECTRODE

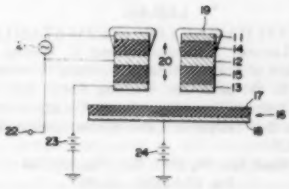
Noriyoshi Tarumi, Hachioji; Haruo Iwahashi, Fussa; Masahiko Matsunawa, and Hiroshi Tokunaga, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,393

Claims priority, application Japan, Aug. 15, 1980, 55-112839

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—159 **6 Claims**



1. An improved multi-layer ion modulating electrode, comprising:

first and second conductive layers between which a high frequency voltage is operatively applied to generate an ion flow;

a first dielectric layer interposed between said first and second conductive layers;

a third conductive layer to which a control voltage is operatively applied for regulating the ion flow;

a second dielectric layer interposed between said second and third conductive layers;

said first, second and third conductive layers, and said first and second dielectric layers, being stacked together to form an integral electrode structure, and said integral structure further including a plurality of apertures defined through all of said layers of the electrode stack to delineate passages for the ion flow; and

a thin film coating of, at most, limited conductivity over the entire exposed surface area of said first conductive electrode including those surface portions of the first conductive electrode disposed within said apertures.

4,426,655

MEMORY CELL RESISTOR DEVICE

Harsaran S. Bhatia, Wappingers Falls; David B. Eardley, Stanfordville, and Santosh P. Gaur, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1981, Ser. No. 293,413

Int. Cl.³ H01L *29/74, 29/48*

U.S. Cl. 357—21 **12 Claims**

1. A dynamic semiconductor memory cell comprising:

a substrate;

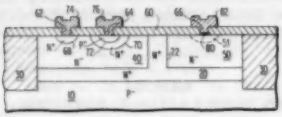
a first layer of one conductivity type formed on said substrate;

a second layer of said one conductivity type formed on said first layer, said second layer lightly doped with respect to said first layer;

means to divide said second layer into two separated areas;

an injector region formed on the surface of said second layer in one of said separated areas of a doped opposite conduc-

tivity type, said injector region including a heavily doped zone of said one conductivity type surrounding said opposite conductivity type within said second layer;



a source region formed in one of said two separated areas containing said injector region; and

a drain region formed in the other of said separated areas by a low barrier Schottky contact with said second layer.

4,426,656

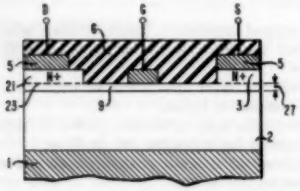
GaAs FETs HAVING LONG-TERM STABILITY

James V. DiLorenzo, Millington; James C. Hwang, Berkeley Heights, both of N.J.; William C. Niehaus, Wyomissing, Pa.; Wolfgang O. W. Schlosser, Basking Ridge, and Stuart H. Wemple, Chatham Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 29, 1981, Ser. No. 229,744

Int. Cl.³ H01L *29/80*

U.S. Cl. 357—22 **6 Claims**



1. In a field effect transistor device comprising an active region of GaAs, a source, a gate, and a drain wherein said drain comprises a drain ledge contacting said active region and an electrical contact to said drain ledge CHARACTERIZED IN THAT said device is passivated with a material that prevents oxidation of said active region, said ledge extends beyond the edge of said contact in the direction of said gate, and dendrites formed during the fabrication of said contact terminate with the boundaries of said ledge.

4,426,657

SEMICONDUCTOR DEVICE AND METHOD FOR PRODUCING SAME

Akira Abiru, Yokohama; Masahiro Sugimoto, Yokosuka, and Juro Inomata, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

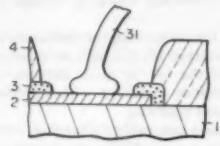
Filed Feb. 13, 1981, Ser. No. 234,196

Claims priority, application Japan, Feb. 13, 1980, 55-16334

Int. Cl.³ H01L *27/04*; G11C *11/40*

U.S. Cl. 357—29 **6 Claims**

1. A semiconductor device comprising a substrate having at least one semiconductor element for forming an integrated circuit, said substrate being surrounded by other members of said semiconductor device, the surface of at least a region of said substrate where each said semiconductor element is formed being coated at least in part with a polyimide film having incorporated therein finely divided silicon particles of high purity, wherein each said semiconductor element is protected by said film from alpha radiation from any of said other members.



4,426,658

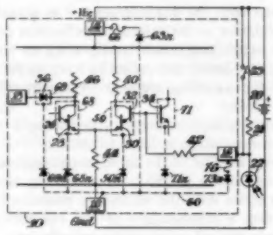
IC WITH PROTECTION AGAINST REVERSED POWER SUPPLY

Walter S. Gontowski, Jr., Thompson, Conn., assignor to Sprague Electric Company, North Adams, Mass.

Filed Dec. 29, 1980, Ser. No. 221,084

Int. Cl.³ H01L *27/04*

U.S. Cl. 357—48 **4 Claims**



1. An integrated circuit with protection against reversed power supply including a silicon substrate of one conductivity type having grown on one face thereof an epitaxial layer of the other type that is divided into a plurality of PN junction-isolated pockets, an insulative film over the outer surface of said epitaxial layer, a pair of metal termination pads on said insulative film consisting of a ground pad ohmically connected to said substrate and a Vcc pad, said pair of pads being adapted for connecting the integrated circuit to a DC power source, wherein the improvement comprises

a fusible link making a low resistance connection between a first of said pockets and said Vcc pads; and

a group of polysilicon resistors having been formed on said insulative film, said PN junction isolated pockets being N-type and being separated by a P-type isolation wall, said polysilicon resistors being positioned over portions, respectively, of said P-type isolation wall, each of said group of resistors completing, respectively, an ohmic connection between each of a group of the others of said pockets and said Vcc pad, so that static charge that is picked up by said Vcc pad during manufacture and assembly in an electrical system will be diverted to the substrate via said fuse link and the isolation diode of said first pocket to prevent destructively high voltage from building up across said insulative layer between said group of polysilicon resistors and said substrate, and so that after assembly and on the occasion of inadvertent reverse connection of said DC supply to said pads, the high potentially destructive current that would flow in the forward direction through the PN junction between said first pocket and said substrate will open said fuse link.

4,426,659

HOUSING FOR HIGH-POWER SEMICONDUCTOR COMPONENTS WITH LARGE DIAMETER INTERMEDIATE CONTACT DISKS OF DIFFERING THICKNESSES

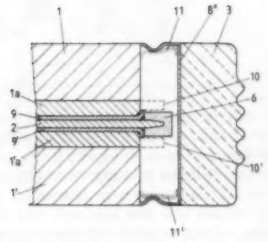
Patrick de Bruyne, Siggenthal; Andre Jaecklin, Ennetbaden, both of Switzerland, and Dieter Eisele, Lampertheim, Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation of Ser. No. 46,372, Jun. 7, 1979, abandoned. This application Apr. 8, 1981, Ser. No. 252,208

Claims priority, application Switzerland, Jun. 30, 1978, 7146/78

Int. Cl.³ H01L *23/02*

U.S. Cl. 357—74 2 Claims



1. A housing for high-power semiconductor components subject to the formation of an arc, the housing comprising:

an insulator forming the lateral boundary of the housing,

a thyristor disposed within said housing,

at least two circular multi-part contacts provided on respective sides of said thyristor,

each multi-part contact consisting of:

a copper disc, and

an intermediate disc between said copper disc and said thyristor,

said intermediate discs being of equal diameter, with the intermediate disc on a cathode side of the thyristor being thicker than on an anode side thereof, and

at least one of said intermediate discs being in pressure contact with said thyristor,

both intermediate discs formed of tungsten or molybdenum, and

a plurality of connecting members which connect said copper discs with said insulator, wherein

said intermediate discs which serve to receive the feet of the arcs have a larger diameter than the copper discs adjacent to said intermediate discs, and said intermediate discs are separated from the inner wall of said insulator by narrow gaps, the spacing of which is dimensioned so that no loop formation of the arc is effected into said gaps, and wherein

said connecting members are protected by a protective ring comprising a material selected from the group consisting of glass fibers, quartz fibers, silicon fibers, a temperature-resistant plastic material, asbestos and ceramics, and

said protective ring is located within said housing, and

said inner wall of said insulator is provided with a protective layer of high-temperature material.

4,426,660

STYLUS FOR DETECTING SIGNALS RECORDED AS GEOMETRIC VARIATIONS AND METHOD FOR MAKING THE SAME

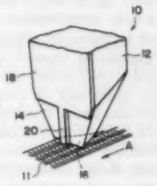
Hideaki Takehara, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Feb. 18, 1981, Ser. No. 235,713

Claims priority, application Japan, Feb. 19, 1980, 55-19385

Int. Cl.³ G11B *9/06*

U.S. Cl. 358—126 2 Claims



1. A stylus for detecting signals recorded as geometric variations in a recording medium, comprising a body of diamond having an elongated rear surface extending from the bottom thereof where in use it contacts said medium and a conductive layer of a carbide compound on said elongated rear surface, said carbide compound being formed by depositing a conductive substance having a strong affinity to carbon on the surface of said diamond body and heating said conductive layer and said diamond body in a vacuum at a temperature in a range between 400° C. to 2200° C. to allow the carbon atoms of said diamond body to diffuse into said conductive layer.

4,426,661

TELEVISION RECEIVER INCLUDING A CIRCUIT FOR DOUBLING LINE SCANNING FREQUENCY

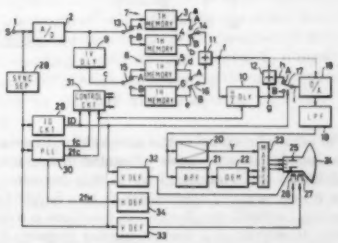
Takashi Okada, and Yutaka Tanaka, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 330,943

Claims priority, application Japan, Dec. 26, 1980, 55-189301

Int. Cl.³ H04N *5/02*

U.S. Cl. 358—140 1 Claim



1. A television receiver comprising, a video signal input terminal supplied with an input video signal, first converter means connected to said video signal input terminal for converting said input video signal to a first converted signal of a double line scanning frequency, a first converted video signal output terminal, second converter means including a field delay circuit and connected to said video signal input terminal for converting said input video signal to a second converted signal of a double line scanning frequency wit one field delay, first signal selecting means connected to said first and second converter means for selecting said first and second converted signals alternately at every H/2 (where H: normal horizontal scanning period) and for supplying the same to said first con-

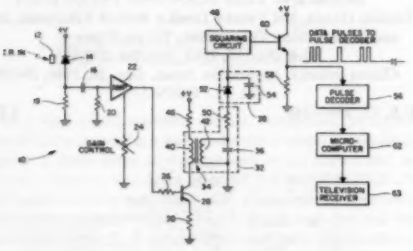
verted video signal output terminal, a horizontal deflection circuit connected to said video signal input terminal for providing a horizontal current of said double line frequency, a vertical deflection circuit connected to said video signal input terminal for providing a vertical current, and a cathode ray tube having horizontal and vertical deflection means connected to said horizontal and vertical deflection circuits for being supplied with said horizontal and vertical deflection currents respectively, characterized in combination of an additional delay circuit of H/2 connected to said first converted video signal output terminal, a signal adder connected between said first converted video signal output terminal and said additional delay circuit, a field identification circuit connected to said video signal input terminal for identifying odd and even fields of said input video signal, second signal selecting means controlled by said field identification circuit for selecting the signal from said signal adder and the output signal from said additional delay circuit alternately in correspondence with said identified odd and even fields, a second converted video signal output terminal connected to said second signal selecting means, signal processing means connected to said second converted video signal output terminal for supplying the signal thereat to said cathode ray tube, and means connected between said field identification circuit and said vertical deflection circuit for shifting the vertical deflection by a predetermined amount during one of odd and even fields such that an interlaced scanning of double line frequency is performed in said cathode ray tube.

4,426,662

IR REMOTE CONTROL DETECTOR/DECODER

Peter C. Skerlos, Arlington Hts., and Thomas J. Zato, Palatine, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 18, 1982, Ser. No. 340,555
Int. Cl.³ H04B 9/00
U.S. Cl. 358—194.1 **7 Claims**



1. In an infrared remote control receiver for processing pulse code modulated control signals generated in response to user selected inputs and modulated by a high frequency carrier signal in translating said control signals to a higher frequency for remotely controlling a plurality of functions in a controlled apparatus by means of a microcomputer responsive to said control signals, a signal detector/decoder comprising:

light detecting means for receiving a remote control signal transmitted by infrared radiation;

a band pass filter tuned to the frequency of said carrier signal and coupled to said light detecting means for filtering said received control signals;

envelope detection means coupled to said band pass filter for demodulating said carrier signal and for recovering said pulse code modulated control signals; and

signal decoding means coupled to said envelope detection means for decoding said pulse code modulated control signals and providing the thus decoded control signals to said microcomputer for controlling said apparatus;

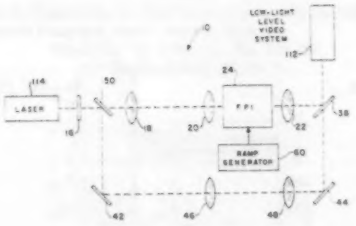
wherein said control signal includes an initialization pulse with said signal decoding means responsive to said initialization pulse for generating and providing a sampling interval signal to said microcomputer and wherein said signal decoding means decodes said pulse code modulated control signals and provides the thus decoded control signals to said microcomputer during said sampling interval.

4,426,663

REAL-TIME OPTICAL FILTERING METHOD WITH IMPROVED FILTERED IMAGE DETECTION AND BANDWIDTH ADJUSTMENT

David W. Evans, Beavercreek, and Arthur P. Ginsburg, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 6, 1982, Ser. No. 337,348
Int. Cl.³ H04N 5/74, 9/31; G01B 9/02
U.S. Cl. 358—211 **3 Claims**



1. In a method of real-time coherent optical filtering of visual imagery including the steps of transmitting a visual target image of an input, filtering said transmitted target image to produce a filtered target image having a variable bandwidth of spatial frequency information, and projecting said filtered target image, the improvement which comprises the steps of:

(a) receiving said projected filtered target image and detecting said image even when at a low level of luminance; and

(b) coherently illuminating said visual target image of said input prior to said transmitting of the same, and adjusting said bandwidth of said filtering between narrow and broad ranges thereof, so as to vary the bandwidth of said spatial information, by varying the power at which said illuminating is carried out between low and high predetermined levels and by varying the wavelength at which said illuminating is carried out within a predetermined range.

4,426,664

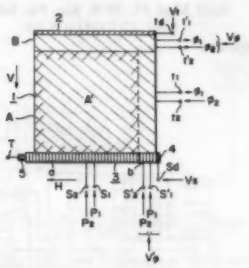
SOLID STATE IMAGE SENSOR

Fumio Nagumo, Atsugi, and Kaneyoshi Takeshita, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,451
Claims priority, application Japan, Apr. 27, 1981, 56-63704
Int. Cl.³ H04N 3/14
U.S. Cl. 358—213 **3 Claims**

1. A solid state image sensor comprising; a sensing element forming portion comprising a charge transfer device wherein a number of sensing elements are formed for producing, storing and transferring vertically a signal charge and divided into a first area A' which contains a sufficient number of sensing elements for a first television format and second and third smaller rectangular areas contiguous to said first area on adjacent sides thereof and wherein said first, second and third areas contain a sufficient number of sensing elements for a second television format; a line transfer portion provided at one end of said sensing element forming portion and composed of a charge transfer device for transferring horizontally the signal charge transferred from said sensing element forming portion; vertical transfer electrodes provided on said sensing element

forming portion for performing the vertical transfer of the signal charge in said sensing element forming portion, said vertical transfer electrodes being divided into first and second groups arranged in the direction of the vertical transfer of the signal charge so as to be supplied with separate driving and/or biasing signals, respectively; with said first group connected to said first and third areas and said second group connected to said second area, horizontal transfer electrodes provided on said line transfer portion for performing the horizontal transfer of the signal charge in said line transfer portion, said horizontal



transfer electrodes being divided into another first S_1, S_2 and second S_1', S_2' groups arranged in the direction of the horizontal transfer of the signal charge so as to be supplied with another separate driving and/or biasing signals, respectively; and said first group connected to portions of said line transfer portion adjacent said first area and said second group connected to portions of said line transfer portion adjacent said third area, and an output portion provided at one end of said line transfer portion for receiving the signal charge transferred from said line transfer portion and producing an output signal in response to the received signal charge.

4,426,665

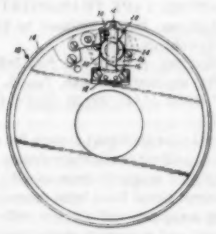
AUTOMATIC TRACK FOLLOWING FEATURE FOR HELICAL VIDEO RECORDER

Robert S. Bradford, Woodland Hills; Marshall R. Brookhart, Thousand Oaks, and Bennett G. Dy, Mission Viejo, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 138,436, Apr. 8, 1980, abandoned. This application Dec. 1, 1982, Ser. No. 445,701

Int. Cl.³ H04N *5/783*

U.S. Cl. 360—10.2 **10 Claims**



1. In a rotary scan video tape player of the type having a playback head operatively mounted within a rotatable drum for scanning a magnetic tape along a plurality of adjacent discrete tracks oriented at an angle relative to the length of the tape, said head being mounted within the drum on a head positioning transducer for moving the head within a given range relative to a nominal position along a path generally transverse to the direction of said tracks in response to a head position control signal, the improvement comprising:

a network for forming said head position control signal which may vary in amplitude and polarity to modify the transverse position of the head according to the need to adjust the angle of the scanning path, the available range of the head positioning transducer, and frame conversion requirements, wherein the instantaneous amplitude Y of the head position control signal varies according to the expression

$$Y = Y_0 + Y_1 + Y_2$$

where Y_0 represents an instantaneous amplitude component related to the difference between the tape speed employed during recording and the instantaneous playback tape speed, Y_1 represents an instantaneous amplitude component related to the need to reset the head positioning transducer to maintain it within its available range and to enable frame conversion, and Y_2 represents an instantaneous amplitude component for centering the head over the recorded tracks, said network including

(a) means for generating each of the Y_0, Y_1, and Y_2 instantaneous amplitude components as discrete signal pulses,

(b) digital counter means coupled to said generating means for combining said discrete pulses and for providing a digital count representative of said combined pulses, said count being the digital representation of the instantaneous amplitude of said head positioning control signal, and

(c) means for converting said digital representation into an analog signal, the magnitude of which is proportional to said count and for providing said head position control signal in which the instantaneous amplitude thereof is proportional to said analog signal,

wherein said means for generating said Y_0 component comprises

(i) means for providing a reference signal containing a predetermined number N of clock pulses per video field extending over a time interval T_v, where N is a reasonably large number, to allow numerous head position adjustments per video field,

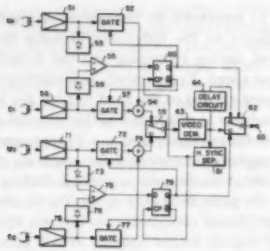
(ii) means for providing an instantaneous tape motion signal having tach pulses indicative of the tape speed and direction of motion, the spacing between successive tach pulses corresponding to the time required for 1/N of the length of tape containing one video field to traverse a given location, where the number of tach pulses M occurring during the time interval T_v is equal to the number of N clock pulses during the same time interval when the playback speed is equal to the record speed, and

(iii) means for supplying said reference signal to said digital counter means for incrementing the number of counts therein by one count in a first direction upon each occurrence of a reference signal pulse, and for supplying said instantaneous tape motion signal to said digital counter means for incrementing the number of counts therein by one count in the opposite direction upon each occurrence of a tach pulse if such pulses are indicative of forward tape motion and for incrementing the number of counts therein by one count in the first direction upon each occurrence of a tach pulse if such pulses are indicative of reverse tape motion such that at any time during each field scan the number remaining in the counter means is proportional to the distance required to move the head transverse to the direction of said tracks to compensate for differences between the instantaneous playback and record speed and direction of tape motion.

4,426,666
VIDEO SIGNAL RECORDING/REPRODUCING APPARATUS

Masaaki Kobayashi, Kawanishi, and Minoru Kohda, Yawata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 5, 1981, Ser. No. 308,857
Claims priority, application Japan, Oct. 3, 1980, 55-138952; Oct. 3, 1980, 55-138953
Int. Cl.³ H04N *5/93*
U.S. Cl. 360—10.3 **13 Claims**



1. A video tape recording/reproducing apparatus comprising:

a first main rotary head and a second main rotary head, said first and second main rotary heads having azimuth angles which are different from each other;

a first sub-rotary head fixed near said first main rotary head;

a second sub-rotary head fixed near said second main rotary head;

a first amplitude detector for detecting the amplitude of a reproduced signal from said first main rotary head;

a second amplitude detector for detecting the amplitude of a reproduced signal from said first sub-rotary head;

a first comparator for comparing the signal level of an output signal from said first amplitude detector with the signal level of an output signal from said second amplitude detector;

a first gate circuit for gating said output signal from said first amplitude detector in accordance with an output signal from said first comparator;

a second gate circuit for gating said output signal from said second amplitude detector in accordance with said output signal from said first comparator;

a first adder for adding an output signal from said first gate circuit to an output signal from said second gate circuit;

a third amplitude detector for detecting the amplitude of an output signal from said second main rotary head;

a fourth amplitude detector for detecting the amplitude of an output signal from said second sub-rotary head;

a second comparator for comparing the signal level of an output signal from said third amplitude detector with the signal level of an output signal from said fourth amplitude detector;

a third gate circuit for gating the output signal from said third amplitude detector in accordance with an output signal from said second comparator;

a fourth gate circuit for gating the output signal from said fourth amplitude detector in accordance with said output signal from said second comparator;

a second adder for adding an output signal from said third gate circuit to an output signal from said fourth gate circuit; and

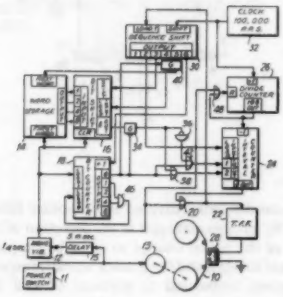
a first switch means for alternately selecting an output signal from said first adder and an output signal from said second adder on a field by field basis so as to thereby obtain a continuous reproduced signal;

wherein lower level signal portions of the reproduced signal from said first main rotary head are replaced by the reproduced signal from said first sub-rotary head and lower level signal portions of the reproduced signal from said second main rotary head are replaced by the reproduced signal from said second sub-rotary head.

4,426,667
PULSE WIDTH MODULATION SYSTEM

Dale P. Masher, Los Altos, and Leonard J. Chaitin, Palo Alto, both of Calif., assignors to Savin Corporation, Stamford, Conn.

Filed May 17, 1978, Ser. No. 906,850
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—44 **21 Claims**



1. Decoding apparatus for a signal having three consecutive transitions between at least two signal levels including in combination means providing a plurality of discretely different reference time intervals, means responsive to the signal for measuring the time intervals between successive transitions, output means responsive to the measuring means and to the reference means for serially providing a first and a second digit each having one of a corresponding plurality of values, the output means comprising means responsive to a measured interval approximately equal to one of the reference intervals for providing a digit the value of which corresponds to such reference interval, and means responsive to the measuring means and operable subsequent to the provision of the first digit but prior to the provision of the second digit for adjusting the reference intervals.

4,426,668
HIGH-SPEED TAPE TRANSPORT SYSTEM

Kenji Itoh, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 3, 1981, Ser. No. 269,887
Claims priority, application Japan, Jun. 3, 1980, 55-74526
Int. Cl.³ G11B *15/46, 19/28, 21/04*; G03B *1/04*
U.S. Cl. 360—73 **6 Claims**

1. A high-speed tape transport system for a magnetic reproducing apparatus, said magnetic reproducing apparatus having a reel for taking up a magnetic tape on which an information signal and a control signal have been recorded, tape transport means including a capstan and a pinch roller for transporting the magnetic tape, and means for reproducing the information signal from the magnetic tape, said tape transport means being made inoperative during a mode of said reproducing apparatus in which the magnetic tape travels at a constant high speed, said high-speed tape transport system comprising:

control signal sensing means for reproducing the control signal from the magnetic tape and producing a speed signal having a frequency indicative of the tape traveling speed;

frequency-to-voltage converter means for producing a voltage in response to the frequency of the control signal from said control signal sensing means, the amplitude of the produced voltage continuously changing according to frequency changes in the control signal;

a reel motor for driving the reel at a rotational speed; and

reel motor speed control means for variably controlling the rotational speed of the reel motor in response to the voltage produced by the frequency-to-voltage converter means,

said rotational speed of said reel motor being controlled by said reel motor speed control, so that the magnetic tape travels at the constant high speed, the constant high speed being higher than a tape traveling speed with which said information signal and said control signal are recorded on the magnetic tape during a recording mode of said reproducing apparatus.

4,426,669

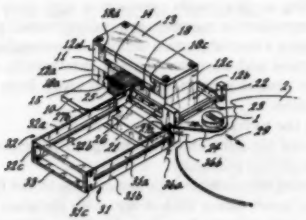
TRANSDUCER POSITIONER IN DISK FILES

Philip Bryer, 4271 Chaumont Rd., Woodland Hills, Calif. 91346

Filed Jan. 22, 1981, Ser. No. 227,416

Int. Cl.³ G11B 5/55

U.S. Cl. 360—106 **17 Claims**



1. A linear actuator for positioning at least one transducer in one of a plurality of positions and for moving the transducer from one of the positions to another one thereof, comprising:

mounting base means;

a flat, bar-shaped, magnetizable core;

magnet means for inducing a homogeneous, magnetic field across the bar, there being gaps between the magnet means and opposite, flat sides of the bar, the magnet further including magnetic return path means coupled to the flat bar at opposite ends;

a coil looping around the flat bar and extending through the gaps for being movably disposed;

frame means of U-shaped configuration, having legs and a transverse base, the coil being fixedly mounted on and between the legs, the transducer being mounted on the base of the frame means;

a pair of flat spring means, each of the flat spring means of the pair having a first leg and a second leg, and an integral juncture at one end of each one of the respective first and second leg, each leg of the spring means having a free end, the free ends of the first legs of the spring means of the pair being secured to one of the legs of the U-shaped frame means, one first leg of one of the spring means being secured in a first point of the frame means near said base of the frame means, the first leg of the other spring means being secured to a second point on the one leg of the U-shaped frame and means spaced from the first point;

a rectangular frame for interconnecting the junctures of the two spring means; and

the second legs of the pair of flat spring means having their respective free ends secured to the mounting base means at points in respective alignment with said points in said one leg of the U-shaped frame means.

4,426,670

METHOD OF PROTECTION OF ELECTRICAL NETWORKS IN THE EVENT OF POWER TRANSIENTS BY MEANS OF A SURGE ARRESTER AND A SURGE ARRESTER FOR THE PERFORMANCE OF THE METHOD

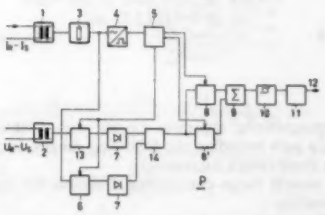
Franc Ilar, Fislisbach, and Fridolin Metzger, Möhlin, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 9, 1982, Ser. No. 347,284

Claims priority, application Switzerland, Feb. 11, 1981, 921/81

Int. Cl.³ H02H 3/40

U.S. Cl. 361—79 **5 Claims**



1. A method of protecting electrical networks in the event of power transients with the use of a surge arrester, comprising the steps of:

continuously monitoring and evaluating the change over time of the impedance of the network, independently of the value of the impedance, with a surge arrester; and

actuating a protective relay when a predetermined change is detected in the monitored change within a predetermined time period.

4,426,671

PROCESS AND APPARATUS FOR THE SHORT-CIRCUIT PROTECTION OF A.C. CIRCUITS

Pierre Braissant, Vevey, and Ivan De Mesmaeker, Windisch, both of Switzerland, assignors to BBC Brown, Boveri & Co., Ltd., Baden, Switzerland

Continuation-in-part of Ser. No. 151,809, May 21, 1980, abandoned. This application Sep. 3, 1982, Ser. No. 414,933

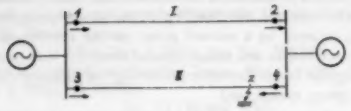
Claims priority, application Switzerland, Jul. 2, 1979, 6177/79

Int. Cl.³ H02H 3/18

U.S. Cl. 361—82 **6 Claims**

1. A process for the protection against short circuits of alternating current circuits formed of at least two lines, each of which is supplied at both ends thereof with a protection relay, which has an output side and which relay can be in a blocking position on the output side, comprising:

maintaining each protection relay on the output side in the blocking position for at least one-half period of the main



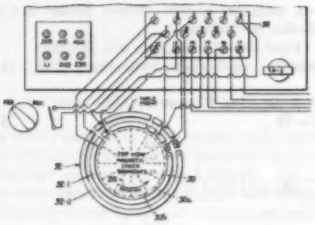
frequency of the alternating circuit on the transition from a blocking condition to a triggering condition.

4,426,672

DEMAGNETIZER

Joseph A. Armond, River Grove, Ill., assignor to Electro-Matic Products Co., Chicago, Ill.

Filed Sep. 30, 1982, Ser. No. 429,112
Int. Cl.³ H01F 13/00
U.S. Cl. 361—145 7 Claims



1. Demagnetizing apparatus for use with a table movable through a path including the following ranges, and movable through those ranges successively:

(a) a neutral range constituting a station for loading and unloading,

(b) a first range constituting a working range,

(c) a second range constituting a demagnetizing range, and in return to

(d) the neutral range,

the table having chuck means therein made up of a plurality of segments arranged in angular series and adapted for placement of workpieces thereon, and capable of moving the chuck segments and carrying the workpieces thereon along said path, comprising,

a pair of collector rings associated with the table and each made up of a plurality of sections, the sections in each ring being electrically separated, the respective sections in the two rings being radially aligned and each two that are so radially aligned constituting a set,

said sets of sections including a first set in said working range, extending a substantial angular distance of the table and being continuous throughout that distance,

additional sets of sections in said demagnetizing range,

each chuck segment including an energizing unit which itself includes a pair of brushes riding on respective collector rings, and each brush being capable of bridging two and only two adjacent sections in a ring,

magnetizing control means energizable by contact engagement of a pair of brushes with the first set of ring sections and the magnetizing control means being thereby operable for energizing the respective chuck segment, and

demagnetizing control means energizable by contact engagement of a pair of brushes with ring sections in said additional sets and the demagnetizing control means being thereby operable for demagnetizing the respective chuck segment.

4,426,673

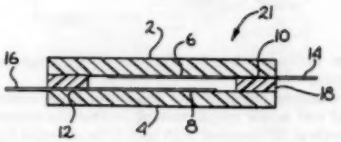
CAPACITIVE PRESSURE TRANSDUCER AND METHOD OF MAKING SAME

Robert L. Bell, Chatsworth; Robert Willing, Anaheim, and Fred Kavli, Woodland Hills, all of Calif., assignors to Kavlico Corporation, Chatsworth, Calif.

Continuation of Ser. No. 898,469, Apr. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 834,498, Sep. 9, 1977, Pat. No. 4,177,496, which is a continuation of Ser. No. 666,188, Mar. 12, 1976, abandoned. This application Mar. 13, 1980, Ser. No. 131,417

The portion of the term of this patent subsequent to Dec. 4, 1996, has been disclaimed.

Int. Cl.³ H01G 7/00
U.S. Cl. 361—283 22 Claims



1. A method for making a capacitive pressure transducer comprising:

preparing two members of substantially zero hysteresis nonconducting material with flat matching opposed surfaces, at least one of said members being thin enough to be flexible;

applying an electrically conductive layer onto each of two nonconductive members in a predetermined pattern, comprising a central portion defining a nonconductive cut out portion and an outer portion substantially surrounding said central portion and spaced away from said central portion;

firing the two nonconductive members;

applying glass frit about the marginal perimeter of at least one of said members;

disposing one member onto the other with the fired conductive layers facing each other, with the glass frit forming the only spacing between the flat matching surfaces of said members; and

firing the members thereby bonding the two members together such that said conductive layers are opposite each other, and separated by a gap produced only by said glass frit, insulated one from the other, and sealed around the periphery of said members by said glass frit.

20. A capacitive sensor for measuring ambient pressure comprising:

two glass pieces, at least one of said glass pieces being capable of flexing in response to a change in pressure, each having a substantially plane surface with conductive electrodes thereon, said glass pieces being positioned to place said conductive electrodes in a spaced apart, substantially parallel relationship;

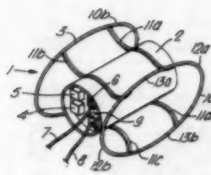
a sealing glass mixture disposed on one of said pieces to seal together said glass pieces, said mixture and said glass pieces acting together to bound a volume having a reference pressure therein whereby changes in ambient pressure cause a change in the capacitance measured between said conductive electrodes.

4,426,674

DISPLACEABLE, ELECTRIC DISTRIBUTION DEVICE FOR BUILDING SITES OR SIMILAR

Hans Holte, N-3810 Gvarv, Norway

PCT No. PCT/NO81/00010, § 371 Date Sep. 23, 1981, § 102(e) Date Sep. 23, 1981, PCT Pub. No. WO81/03088, PCT Pub. Date Oct. 29, 1981
PCT Filed Apr. 13, 1981, Ser. No. 305,648
Claims priority, application Norway, Apr. 14, 1980, 801079
Int. Cl.³ H02B 1/02
U.S. Cl. 361—384 11 Claims



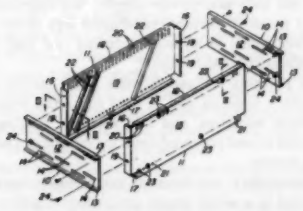
1. A portable electrical distribution apparatus having a housing containing current distribution equipment and rotatable support frame means having at least one stable rotational position and selectively rotatable for moving said housing, said frame means comprising a pair of parallel frame members spaced from one another on opposite sides of said housing, each frame member having a pair of rounded end sections of predetermined radius of curvature and at least one intermediate section of different shape than said end sections to define said one stable rotational position.

4,426,675

CARRIER FOR CIRCUIT BOARDS

Anthony H. J. Robinson, and Erno Peter, both of London, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 5, 1982, Ser. No. 365,443
Int. Cl.³ H05K 1/14
U.S. Cl. 361—415 11 Claims



1. A carrier for circuit boards, comprising:-

a rectangular metal box having a bottom, sides and ends extending up from said bottom and an open top;

a removable metal frame positioned in said box, said frame comprising two parallel spaced apart sides and two parallel spaced apart ends;

each of said ends comprising an elongate web portion and a plurality of pairs of elongate slots at each end of said web portion, the spacing of the slots in each pair being the same for all pairs, said slots extending in a direction corresponding to the spacing of said sides, the pairs of slots at an end being offset relative to each other and in overlapping relationship;

each of said sides comprising a web portion and an inturned edge at each end of the web portion extending normal to the web portion; locating means on each inturned edge comprising two swaged formations spaced apart a distance equal to said spacing of the slots in a pair, the swaged formations positioned in selected ones of said pairs of slots; locking means on each inturned edge, said locking means comprising threaded holes in said swaged formations and screws in said threaded holes engaging with said ends to lock said sides and ends together;

a row of apertures along a top edge of said web portions of each side and a row of apertures along a bottom edge of said web portions of each side, the apertures comprising circular holes along one of said top and bottom edges and slots along the other of said top and bottom edges, the slots extending normal to the edge;

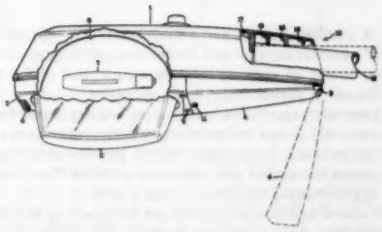
a plurality of channel members removably attached to an inner surface of each of said web portions of said sides, each channel member having a deformable protrusion at each end, the protrusion snapped into said apertures in said sides and being removeable from said apertures.

4,426,676

LUMINAIRE MOUNTING

Carl D. Taylor, Hendersonville, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1982, Ser. No. 446,807
Int. Cl.³ F21P 5/00
U.S. Cl. 362—371 4 Claims



1. A luminaire comprising an upper housing having a longitudinal axis and containing a slipfitter at the rear thereof for clamping onto a support member of a size overlapping the range of about 1¼" O.D. to about 2½" O.D. in a manner allowing adjustable mounting of the luminaire without substitution or reversal of parts,

said slipfitter comprising yoke means for engaging the underside of the support member and a transverse pivot rib in said housing for engaging the topside side of the support member,

said yoke means being adapted to engage the support member at two places longitudinally spaced on each side of the pivot rib,

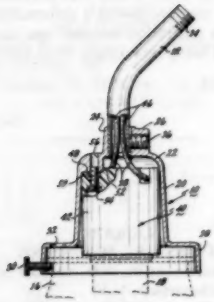
and means for adjustably pressing the yoke means against the support member at said two places in order to rock the luminaire on the pivot rib for leveling purposes and in order to clamp the support member throughout said size range, comprising four thread-forming bolts paired on each side of the pivot rib and on each side of the support member, and cast bosses depending from the housing, said bosses having cored holes sized to accommodate the bolts to the depth of penetration required for leveling and clamping throughout said size range.

4,426,677

COMBINED SHADE AND SOCKET HOLDER

Warren E. Dennis, Pasadena, Calif., assignor to Casablanca Fan Company, Inc., City of Industry, Calif.

Filed Feb. 22, 1982, Ser. No. 351,274
Int. Cl.³ F21V 17/06
U.S. Cl. 362—438 10 Claims



1. A combined shade and socket holder for support at the end of a tubular member and for use in supporting an electrical socket having an opening through a back wall of the socket and for use in supporting a shade, including,

a generally cup-shaped unitary cast housing formed with a generally closed end portion, an open end portion and an intermediate connecting central portion extending between the closed and open end portions for a distance approximating the length of the socket,

the closed end portion including a first opening and extending from the first opening an outwardly extending tubular portion having an unthreaded interior surface for receiving an end portion of the tubular member and a stop surface within the tubular portion for limiting the extension of the end portion of the tubular member within the tubular portion of the tubular member within the tubular portions,

the closed end portion additionally including means adjacent the tubular portion for locking the end portion of the tubular member within the tubular portion,

the central portion for receiving and enclosing the electrical socket to have the back wall of the electrical socket positioned adjacent the interior surface of the closed end portion and with the closed end portion including a second opening complementary in position to the opening through the back wall of the socket,

means coupled to the complementary openings in the electrical socket and the closed end portion for locking the electrical socket in the received position within the central portion, and

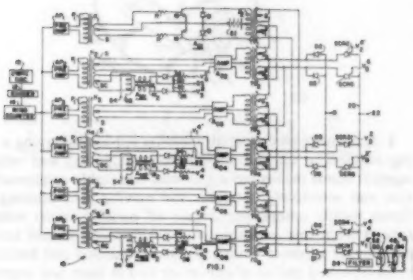
the open end portion extending outwardly relative to the closed end portion for receiving an end portion of the shade and additionally including means for locking the shade in the received position to extend away from the electrical socket.

4,426,678

D.C. TO D.C. CONVERTER

Albert E. Willis; John M. Gould; Jack L. Matheney, all of Huntsville, and Harrison Garrett, Decatur, all of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 28, 1982, Ser. No. 383,083
Int. Cl.³ H02M 3/335
U.S. Cl. 363—25 5 Claims



1. A D.C. to D.C. converter comprising:

signal generating means for generating a plurality of trains of rectangular-shaped signals wherein one train is displaced in time from another train;

a direct current power supply;

a like plurality of switching means, each being connected in circuit with said power supply, and responsive to one of said trains of rectangular-shaped signals for providing a power signal as an output during one half cycle of said rectangular-shaped signal;

a like plurality of transformers, each having at least one primary winding and at least two, first and second, secondary windings, and said primary winding being connected to and powered from the output of one said switching means;

said secondary windings of said transformers being connected in a series circuit consisting of a first series string consisting of said first windings of each said transformer, followed by and including a second series string consisting of said second windings, and wherein the entire series connected windings form a ring configuration;

a first common terminal of one polarity, and a second common terminal of an opposite polarity, and a load circuit being connectable between said terminals;

a plurality of rectifying circuits, each comprising a pair of rectifying devices connected in series between said terminals, and each having a midpoint terminal between said first and second terminals, and both rectifying devices being poled to pass current in a single direction between said first and second terminals;

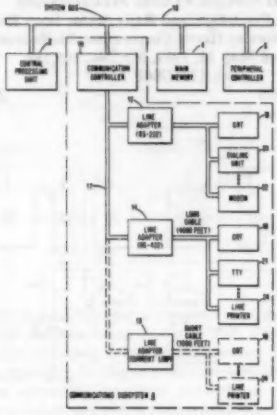
a said mid-point terminal of each rectifying circuit, between rectifying devices, being discretely connected between each two series connected windings.

4,426,679

COMMUNICATION MULTIPLEXER USING A RANDOM ACCESS MEMORY FOR STORING AN ACKNOWLEDGE RESPONSE TO AN INPUT/OUTPUT COMMAND FROM A CENTRAL PROCESSOR

Kin C. Yu, Burlington, and Gary J. Goss, Acton, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 29, 1980, Ser. No. 192,127
Int. Cl.[3] G06F 3/00
U.S. Cl. 364—200 10 Claims



1. A data processing system for transferring data bytes includes a system bus, a central processing unit (CPU) coupled to said system bus and generating a plurality of input/output command signals indicative of a first input/output command and a second input/output command and a plurality of channel number signals indicative of a plurality of communication channels, a main memory coupled to said system bus for storing said data bytes, and a communication multiplexer coupled to said system bus for receiving said plurality of input/output command signals and said plurality of channel number signals for controlling the transfer of said data bytes between each of said plurality of communication channels and said main memory, said communication multiplexer comprising:

first means coupled to said system bus and responsive to said plurality of input/output command signals and said plurality of channel number signals for generating a first not-acknowledge signal in a first state indicative of said communication multiplexer being unable to process said first or said second input/output command for one of said plurality of communication channels;

second means coupled to said first means and said system bus and having means responsive to said plurality of input-/output command signals and said first not-acknowledge signal in said first state for generating a second not-acknowledge signal to said CPU indicative of a not-acknowledge response by said communication multiplexer of a request by said CPU for the processing of said first or said second input/output command for said one of said plurality of communication channels;

third means coupled to said system bus for storing signals representative of a plurality of communication control blocks (CCB's), block transfer information and difference pointer information; and

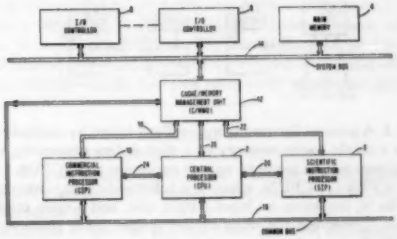
fourth means coupled to said system bus, said first means and said third means and responsive to said plurality of input-/output command signals and said difference pointer information signals for writing into said first means a binary bit in a first state indicative of said first not-acknowledge signal in a first state at a location defined by said plurality of channel number signals if said difference pointer information signals indicate that said communication multiplexer is unable to process said first or said second input/output command for said one of said plurality of communication channels and writes into said first means said binary bit in a second state indicative of said first not-acknowledge signal in a second state if said difference pointer information signals indicate that said communication multiplexer is able to process said first or said second input/output command for said one of said plurality of communication channels.

4,426,680

DATA PROCESSOR USING READ ONLY MEMORIES FOR OPTIMIZING MAIN MEMORY ACCESS AND IDENTIFYING THE STARTING POSITION OF AN OPERAND

Steven A. Tague, Billerica, and Virendra S. Negi, Pepperell, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 24, 1980, Ser. No. 219,809
Int. Cl.[3] G06F 7/38
U.S. Cl. 364—200 10 Claims



1. A commercial instruction processor (CIP) for executing decimal alphanumeric instructions on operands stored in a memory, said operands being made up of a plurality of words, each of said plurality of words having a plurality of characters in a plurality of character positions, said CIP including apparatus for receiving data descriptor information describing the characteristics of said operands and decimal alphanumeric instruction information from said memory, and generating a plurality of signals for aligning said operands comprising:

register means coupled to said memory for storing data descriptor signals received from said memory and representative of a length of one of said operands, indicative of said one operand being in a predetermined form, and indicative of a position of a predetermined starting character of said one operand when stored in said memory;

control store means coupled to said memory and responsive to said instruction information for generating instruction direction signals indicative of whether the character positions of said operands would be processed in a left-to-right or a right-to-left direction by said CIP;

read only memory means coupled to said register means and said control store means and responsive to said data descriptor length signals, said data descriptor predetermined form signal, said data descriptor position signals, and said instruction direction signals, all of which are applied to a plurality of address terminals of said read only memory means for generating said plurality of aligning signals representative of bits stored in an address location identified by the signals applied to said plurality of address terminals;

first means coupled to said read only memory means and responsive to a first plurality of said aligning signals for generating signals, indicative of the number of read cycles

needed to transfer a predetermined number of words of said plurality of words of said one operand from said memory; and

second means coupled to said read only memory means and responsive to a second plurality of said aligning signals for generating signals for indicating said predetermined starting character position.

4,426,681

PROCESS AND DEVICE FOR MANAGING THE CONFLICTS RAISED BY MULTIPLE ACCESS TO SAME CACHE MEMORY OF A DIGITAL DATA PROCESSING SYSTEM HAVING PLURAL PROCESSORS, EACH HAVING A CACHE MEMORY

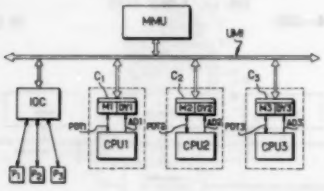
Pierre C. A. Bacot, Chaville, and Michel Isert, Paris, both of France, assignors to CII Honeywell Bull, Paris, France

Filed Jan. 22, 1981, Ser. No. 227,222

Claims priority, application France, Jan. 22, 1980, 80 01351

Int. Cl.³ G06F *13/00, 15/16*

U.S. Cl. 364—200 **15 Claims**



1. A process for managing conflicts raised by multiple access to a single cache memory of a digital data processing system having: a main memory unit, N processor units CPU1, CPU2 . . . CPUk . . . CPUN, where k is selectively every integer from 1 to N, inclusive, an input-output unit, and a main connector bus connecting the units of the system; each processor unit including a cache memory containing a memory section and an index section for identifying data contained in the memory section, the processing of a task by processor unit CPUk including: deriving at least one request for access to at least one data item present in the cache memory of unit CPUk or in a processor unit CPUj or in the main memory unit, where j differs from k, an access request by processor unit CPUk to the cache memory of the processor unit CPUk being an internal request, enabling the internal request by the cache memory of processor unit CPUk, thereupon implementing the internal request in the cache memory of processor unit CPUk, the cache memory of processor unit CPUk responding to an external request derived by processor unit CPUj to process another task, calling at least one data item in the cache memory of processor unit CPUk for access via the connector bus, said process avoiding a conflict between processing of internal and external requests by the same cache memory while promoting the simultaneous processing of these requests, the process comprising: enabling an external request derived by processor unit CPUk and addressed to the cache memory of every processor unit CPUj, enabling the external request by the cache memory of every processor unit CPUj so the external request is considered by the cache memory of every processor unit CPUj, analyzing the external request in the cache memory of every processor unit CPUj, processing the external request by the cache memory of the one processor unit CPUj affected by this external request, the one affected processor unit being CPUg, authorizing the simultaneous processing by the cache memory of processor unit CPUg of internal and external requests provided that the internal and external requests are addressed to different resources of processor unit CPUg, and selectively interrupting the present processing of an internal request or preventing enabling of an internal request if the present processing of an external request requires all of the resources of processor unit CPUg or interrupting the present processing of an external request or delaying enabling of an external request if the present processing of an internal request requires all of the resources of processor unit CPUg.

4,426,682

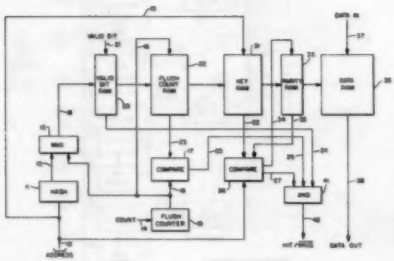
FAST CACHE FLUSH MECHANISM

Josephus Riffe, Plantation, and Rajiv Sinha, Boca Raton, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed May 22, 1981, Ser. No. 266,139

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **25 Claims**



1. For use in a data processing system having a cache in which information to be employed during the operation of said system may be stored and accessed, an arrangement for controlling the validity of the information stored within said cache comprising:

a first memory section, respective memory locations of which are associated with respective cache memory locations in which said information is stored in the cache;

a second memory section for storing data representative of whether or not information contained in the respective cache memory locations in which said information is stored in the cache is valid information;

first means for storing a reference code, the value of which is selectively variable;

second means, responsive to a request to store valid information in a selected cache memory location, for storing, in the associated memory location in said first memory section, the reference code stored by said first means and for storing, in the associated memory location in said second memory section, data representative of the validity of said information;

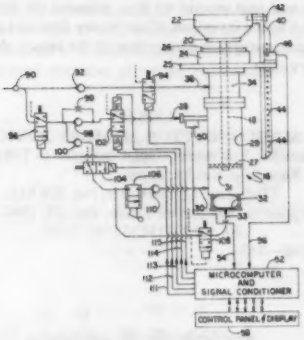
third means, coupled to said first and second memory sections and to said first means, and responsive to a request to access valid information stored in a selected cache memory location, for comparing the contents of the associated memory location in said first memory section with the reference code stored by said first means, and for generating an output indicative that the information stored in said selected cache memory location is invalid in response to a mismatch between the contents of the associated memory location in said first memory section and said reference code stored by said first means or in response to the data contained in the associated location in said second memory section representing that the information is invalid; and

fourth means, responsive to a request to render invalid all information stored in said cache, for changing the reference code stored by said first means.

4,426,683
PNEUMATIC SHOCK TESTING MACHINE WITH DIGITAL CONTROL

Robert R. Kissell, New Carlisle, Ohio, assignor to Avco Corporation, Huntsville, Ala.

Filed Nov. 2, 1981, Ser. No. 317,188
Int. Cl.³ G01M *17/04*
U.S. Cl. 364—508 **8 Claims**



1. Control apparatus for a machine used to generate shock pulses, said machine being powered from a source of pressurized air and including a base and supported thereon a charge cylinder assembly having a pneumatically driven piston rod extending upwardly therefrom through an anvil flange, the uppermost end of said piston rod terminating at an impact plate on which a carriage assembly is mounted, said carriage assembly being useful for attaching test specimens thereto, said machine having control valves in the air supply lines connected to the lift, brake and charge pressure sections of said charge cylinder assembly, there additionally being provisions for inserting shock generator elements between said anvil and said impact plate, said apparatus comprising:

means for measuring the instantaneous separation of said carriage assembly from said anvil and generating therefrom a first set of electronic signals indicative thereof;

means responsive to the air pressure in said charge cylinder including the generation of a second set of electronic signals indicative of the measurement thereof;

a computer including a memory and support logic for processing said first and second sets of electronic signal data and deriving therefrom commands in accordance with programmed instructions;

a control panel coupled to said computer for inserting programmed instructions therein via a keyboard; and

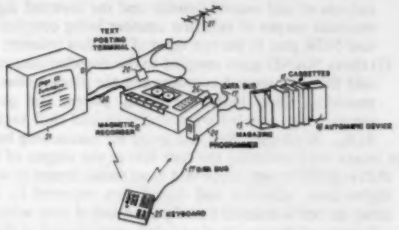
control valve actuating means responsive to commands derived in said computer in accordance with control panel instructions taken together with said first and second electronic signal data set measurements.

4,426,684
SCRATCH PAD MEMORY FOR CASSETTE OF MAGNETIC TAPE RECORDING

Claude Sechet, Rennes; Christian Gautier, Acigne, and Gabriel Degoulet, Goven, all of France, assignors to Etablissement Public de Diffusion dit "Telediffusion de France" and L'Etat Francais, represente par le Secretaire d'Etat aux Postes et Telecommunications et a la Telediffusion (Centre National d'Etudes des Telecommunications), France

Filed Jul. 7, 1980, Ser. No. 166,243
Claims priority, application France, Jul. 9, 1979, 79 18180
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—900 **7 Claims**

1. A scratch pad memory for identifying program material recorded on a magnetic tape in a cassette or cartridge, said program material being recorded or changed responsive to user command; said scratch pad memory comprising address register means; read only storage memory means accessed via said address register means; first interface means, read/write memory means accessed via said interface means, said read/write memory means being rewritable with new information data; teletext terminal means; data bus means for interconnecting said first interface means, said address register means, and

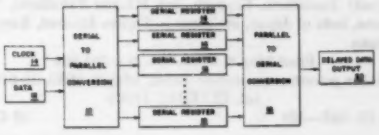


said telextext terminal means; television receiver means coupled to display said program material responsive to said stored data and said information data; control circuit means for controlling the read out of said scratch pad memory responsive to addresses delivered from said address register means; and means for causing said address register to jump to predetermined addresses in order to collate data stored in said read only storage memory means, and said read/write memory means.

4,426,685
SOLID STATE DELAY DEVICE

Robert W. Lorentzen, Milpitas, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 888,118, Mar. 20, 1978, abandoned.
This application Mar. 29, 1982, Ser. No. 363,336
Int. Cl.³ G06F *13/02*
U.S. Cl. 364—900 **1 Claim**



1. A solid state delay device for delaying a continuous stream of serial digital data in the form of 8-bit words of PCM NRZL data for a fixed period of time which comprises:

(a) fifteen shift registers identified by S_1, S, ...S_{15}, each said shift register having the same length;

(b) means for coupling said digital data to the input of each said shift register;

(c) clock means for providing a series of clock pulses in synchronism with said digital data;

(d) means for distributing said clock pulses to said shift registers to load said first data bit received in shift register S_1, the second data bit in shift register S_2..., the 15th data bit in shift register S_{15}, the sixteenth bit received being loaded in shift register S_1, thereby shifting said first bit to the second position in said shift register S_1, and so on for succeeding bits; wherein said means for distributing said clock pulses to said shift registers includes:

(1) a first counter having a data input, a reset input, eight decoded outputs, and a carry output, the clock pulses being coupled to said data input of said first counter;

(2) a second counter having a data input, a reset input, and five decoded outputs, the carry output of said first counter being coupled to the data input of said second

counter and the fifth decoded output of said second counter being coupled to the rest input of said second counter;

(3) a third counter having a data input, a reset input, and three decoded outputs, the data input of said third counter being coupled to the carry output of said first counter, the third decoded output of said third counter being coupled to the rest input of said third counter;

(4) a three-input NOR gate, the first and third decoded outputs of said second counter and the inverted eighth decoded output of said first counter being coupled via said NOR gate to the rest input of said first counter; and

(5) thirty NAND gates coupled to the decoded outputs of said first and second counters and the clock pulses for providing thirty individual gating pulses, said gating pulses being coupled sequentially to said shift register $S_1,S_2,...S_{15},S_1,S_2,...S_{15}$, and so on for succeeding bits,

(e) means for combining the data bits at the output of said shift register to reproduce said continuous stream of serial digital data, whereby said digital data received by said delay device is delayed by a fixed period of time which is a function of the length of said shift registers and of the bit rate of said digital data; and wherein said means for combing the data bits at the output of said shift registers includes:

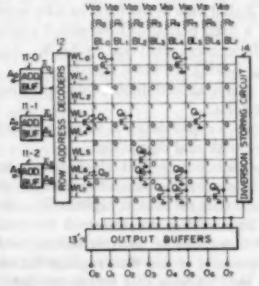
(a) parallel-input, serial-output shift register means having its input coupled to the data output of said shift registers S_1–S_{15}, the output of the shift registers S_1, S_2...S_{15} being coupled to the first input, second input,...15th input, respectively, of said parallel-input, serial-output shift register means, the load input of said parallel-input, serial-output shift register means being coupled to the third decoded output of the third counter for loading the outputs of said shift register S_1–S_{15} into the parallel-input, serial-output shift register means, the lock input of said parallel-input, serial-output shift register means being coupled to said clock pulses for serially shifting said register synchronously with the bit rate of said digital data.

4,426,686

READ-ONLY MEMORY DEVICE

Tsuyoshi Yamamoto, Sapporo, and Hitoshi Takahashi, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 8, 1981, Ser. No. 261,964
Claims priority, application Japan, May 8, 1980, 55-61030
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—104 **15 Claims**



7. A read-only memory device comprising:

first bit lines;

a second bit line;

a word line having associated therewith binary data having first and second bits;

memory cells, each operatively connected between said word line and one of said first bit lines, for storing binary data or the inversion of the binary data in dependence upon the number of first bits in the binary data associated with said word line and being driven by said word line;

inversion indicating means, operatively connected between said word line and said second bit line, for indicating that the binary data associated with said word line is stored as the binary data or as the inversion of the binary data; and

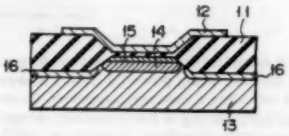
a coincidence circuit, operatively connected to said first bit lines and said second bit line, wherein the binary data is stored as the inversion of the binary data said coincidence circuit converts the inversion of the binary data into the binary data.

4,426,687

SEMICONDUCTOR MEMORY DEVICE

Fujio Masuoka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 12, 1981, Ser. No. 224,012
Claims priority, application Japan, Jan. 25, 1980, 55-7525
Int. Cl.³ G11C *11/40, 7/00*
U.S. Cl. 365—182 **6 Claims**



1. A tapered isolated gain semiconductor device comprising:

a first field effect transistor capable of being in one of two binary states, said transistor having a source, a drain, a channel which is formed on a substrate, an insulating film tapered to have a thin portion on said channel, and a gate electrode laid on said insulating film, the conductance of said first field effect transistor indicating the binary state of said first field effect transistor and varying according to the presence and absence of charge between said source and said drain; and

a field effect transistor circuit for detecting the conductance of said first field effect tranisistor to determine which one of said binary states said first field effect transistor is in, said circuit including

a second field effect transistor having a conductance G_D equal to one half the sum of G_1, the conductance of said first field effect transistor when it is in a first binary state, and G_0, the conductance of said first field effect transistor when it is in a second binary state, said second field effect transistor also having a channel width to channel length ratio approximately equal to $(G_1+G_0)/(2\times G_1)$ the channel width to channel length ratio of said first field effect transistor and

means for comparing the conductances of said first and said second transistors to determine the binary state of said first transistor.

4,426,688

MEMORY SYSTEM HAVING AN ALTERNATE MEMORY

David C. Moxley, Irmo, S.C., assignor to NCR Corporation, Dayton, Ohio

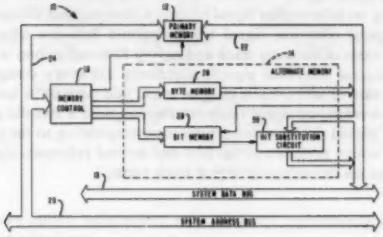
Filed Aug. 3, 1981, Ser. No. 289,640
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—200 **12 Claims**

1. A memory system, comprising:

a primary memory having a plurality of addressable memory locations each of which has memory cells for storing a

primary group of data bits, with some of the memory cells of the primary memory being defective;

an alternate memory for storing replacement data bits to replace any data bits stored in said primary memory at locations having a defective memory cell, said alternate memory including a first alternate memory portion having a plurality of addressable memory locations each of which is for storing a first alternate group of bits, and a second alternate memory portion having a plurality of addressable memory locations each of which is for storing second alternate groups of bits, where each first alternate group of bits consists of a first predetermined number of bits and each second alternate group of bits consists of a second



predetermined number of bits, and where said first predetermined number is greater than said second predetermined number; and

means for replacing bits in the primary groups of bits read from locations in said primary memory having a defective memory cell with bits from the first and second alternate groups of bits, so that bits in the primary groups from locations having more than said second predetermined number of defective bit cells are replaced with bits from the first alternate groups of bits and bits in the primary groups from other locations having defective bit cells are replaced with bits from the second alternate groups of bits.

4,426,689

VERTICAL SEMICONDUCTOR INTEGRATED CIRCUIT CHIP PACKAGING

Robert A. Henle, Clinton Corners, and Alfred H. Johnson, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 19,392, Mar. 12, 1979, Pat. No. 4,266,282. This application Nov. 28, 1980, Ser. No. 210,880

Int. Cl.³ G11C *5/04*

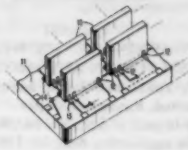
U.S. Cl. 365—52 **17 Claims**

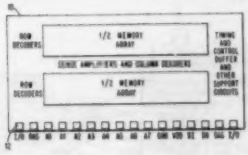
1. A vertical semiconductor chip package comprising:

a substrate;

a semiconductor integrated circuit chip having two major faces and four edges with its signal and power terminals located on one edge of the chip; and

said semiconductor chip is electrically and physically connected to said substrate at said one edge of said chip by suitable physical connections to electrical paths on or in said substrate for signal interconnection and power distri-





bution to and from the semiconductor chip, and for physical support of the chip.

4,426,690

OPTICAL REPRODUCING DEVICE HAVING FOCUS SERVO SYSTEM

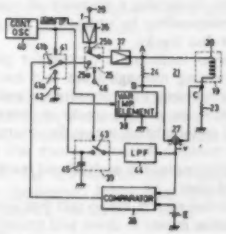
Tadashi Motoyama, Ebina, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 7, 1982, Ser. No. 337,825

Claims priority, application Japan, Jan. 14, 1981, 56-4165

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—45 **14 Claims**



1. An optical reproducing device for reproducing information from a rotating record medium with a light beam directed thereon, comprising:

a light source for emitting said beam through a focusing lens on to said record medium;

a focus control system comprising an electromagnetic motor having a moving coil for displacing said focusing lens perpendicular to the plane of said record medium;

a capture range search system for driving said motor to move said focusing lens at a substantially constant speed from a rest position until it is positioned within the capture range of said focus control system, said capture range search system comprising:

a bridge circuit with four sides for sensing the moving speed of said focusing lens, said bridge circuit including said moving coil and a variable impedance element in two respective sides of said four sides of said bridge circuit;

a control circuit for controlling said variable impedance element to balance said bridge circuit when said focusing lens is at said rest position; and

a drive circuit for supplying a drive current to said moving coil of said motor in response to an output of said bridge circuit so that said output of said bridge circuit becomes

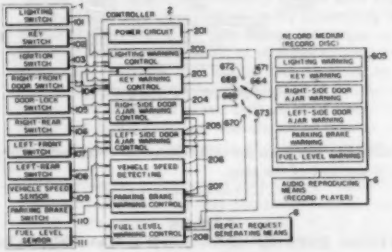
substantially constant in a balanced state of said bridge circuit.

4,426,691

VOICE WARNING DEVICE WITH REPEAT MECHANISM FOR AN AUTOMOTIVE VEHICLE

Teruo Kawasaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Continuation-in-part of Ser. No. 163,503, Jun. 23, 1980, abandoned. This application Aug. 28, 1981, Ser. No. 297,198
Claims priority, application Japan, Jul. 2, 1979, 54-82685
Int. Cl.³ G08B *19/00*
U.S. Cl. 369—21 **12 Claims**



1. A voice warning device for an automotive vehicle comprising:

detecting means for checking various check points in the vehicle to detect abnormal conditions of said check points, said detecting means producing a first signal when it detects an abnormal condition of one of said check points;

a record disc containing a plurality of voice warning messages corresponding to respective said check points on respective disc tracks;

a record player including a pickup for picking up the recorded warning message from said tracks, an actuation means for turning the record disc and positioning the pickup onto one of said tracks in response to said first signal and an initializing means for returning the pickup to the initial position thereof in which said pickup is located at the starting point for each of said tracks and away from the record disc;

a switch member responsive to said first signal for activating said actuation means to drive said record player to reproduce the warning message identified by said first signal;

stop means for stopping record player operation after expiration of a predetermined duration of reproduction of the warning message; and

resetting means for resetting said stopping means for controlling the record player to reproduce the warning message which was most recently reproduced.

4,426,692

ROTARY RECORDING MEDIUM HAVING AN IMPROVED THREE FREQUENCY PICKUP TRACKING CONTROL AND REPRODUCING APPARATUS THEREFOR

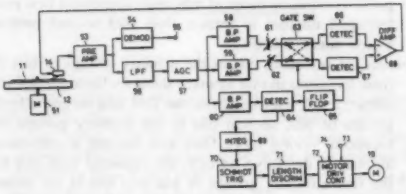
Atsumi Hirata, Fujisawa, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 6, 1981, Ser. No. 232,222
Claims priority, application Japan, Feb. 7, 1980, 55-13020
Int. Cl.³ G11B *21/12, 21/10, 21/08*
U.S. Cl. 369—32 **6 Claims**

1. A rotary recording medium comprising: a continuous spiral main track including main track turns having an information signal recorded thereon and specific track turns having no information signal recorded thereon; and a continuous spiral reference signal track disposed between adjacent track turns of the main track and having first and second tracking control reference signals recorded alternately for every complete track turn of said reference signal track,

said main track having a third reference signal recorded thereon for a specific existence period at respective positions corresponding to the positions where the first and second reference signals change on the reference signal track turns, said specific track turns of the main track having the third reference signal recorded thereon with a predetermined existence period which is longer than said specific existence period of the main track turns.

4. A reproducing apparatus for reproducing a rotary recording medium, said rotary recording medium comprising: a continuous signal main track including main track turns having an information signal recorded thereon and specific track turns having no information signal recorded thereon; and a continuous spiral reference signal track disposed between adjacent track turns of the main track and having first and second tracking control reference signals alternately for every complete track turn of said reference signal track, said main track having a third reference signal recorded thereon with a specific existence period at respective positions corresponding to the positions where positions of the first and second reference signals change on the reference signal track turns,



said specific track turns of the main track having the third reference signal recorded thereon with a predetermined existence period which is longer than said specific existence period of the main track turns, said reproducing apparatus comprising:

a reproducing tracing element for reproducing the signals from said recording medium;

comparing means for comparing the level differences between first and second reference signals reproduced from said reference signal track by said reproducing tracing element, to produce an output control signal;

switching means for switching the first and second reference signals thus reproduced, in response to the third reference signal reproduced from said main track by said reproducing tracing element, and for supplying the switched signals to said comparing means:

tracking control means supplied with said output control signal, for controlling the tracking of said reproducing tracing element;

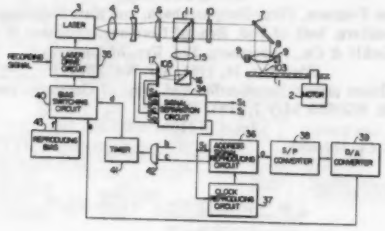
discriminating means for discriminating the third reference signal having said predetermined existence period produced by said reproducing tracing element; and transfer control means for controlling the transfer of said reproducing tracing element by the output of said discriminating means.

4,426,693

LIGHT SOURCE INTENSITY CONTROL IN AN OPTICAL RECORDING AND REPRODUCING APPARATUS

Isao Satoh, Neyagawa; Tomio Yoshida, Katano; Shunji Harigae, Neyagawa, and Kenji Koishi, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 31, 1981, Ser. No. 288,915
Claims priority, application Japan, Aug. 7, 1980, 55-108945
Int. Cl.³ G11B 7/00
U.S. Cl. 369—45 2 Claims



1. An optical information recording and reproducing apparatus comprising:

a disk-shaped information carrier having a guide track on an information recording surface, said guide track having a serial digital address signal sequentially changing in a predetermined sequence prerecorded thereon,

a laser light source for emitting a light beam for recording and reproducing information on and from said information carrier,

an optical system for focusing said light beam on said information carrier as a small spot light,

servo control means for causing said small light spot to track along and focus on said guide track of said information carrier,

means for reading said serial digital address signal prerecorded on said guide track,

means for converting said serial digital address signal to a parallel digital address signal,

means for converting said parallel digital address signal to an analog address signal,

means for generating a control gate signal upon detection of an address signal on a said guide track,

means for controlling the intensity of the recording light beam of said laser light source by said analog address signal at predetermined times as determined by said control gate signal.

4,426,694

BEAM POSITION DETECTING DEVICE FOR OPTICAL DISC APPARATUS

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Sep. 11, 1981, Ser. No. 301,195
Claims priority, application Japan, Sep. 17, 1980, 55-128883
Int. Cl.³ G11B 7/00, 21/10
U.S. Cl. 369—46 9 Claims

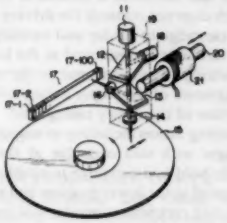
1. A beam position detecting device for an optical disc apparatus which records and reads information on and out of an optical disc by radiating a light beam from a moveable optical head onto the optical disc, comprising:

a photosensor supported at a fixed position spaced apart from the optical head and including a plurality of photoelectric elements arranged in a line in the radial direction of the optical disc;

a beam splitter integrally formed with the optical head for splitting a light beam reflected from the optical disc and directing a portion of the reflected light beam toward said photosensor;

means for driving said beam splitter together with the optical head and in the radial direction of the optical disc, wherein said photosensor is scanned by the portion of the reflected light beam from said beam splitter so that the photoelectric elements of said photosensor sequentially produce photoelectric signals;

readout means for sequentially reading out the photoelectric signals from said photosensor and for producing an initial address signal; and



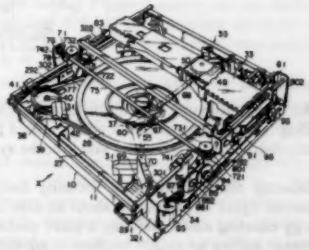
light beam position detecting means coupled to said readout means and including a sampling pulse signal generator for generating sampling pulse signals in response to the photoelectric signals, a sawtooth signal generator for generating a sawtooth signal in synchronism with the initial address signal of said readout means, means for sampling the sawtooth signal from the sawtooth signal generator in response to the sampling pulse signals from said sampling pulse signal generator and for producing a corresponding sawtooth signal component, and judging means for determining the position of the light beam in accordance with the sawtooth signal component.

4,426,695

DISC REPRODUCING APPARATUS

Takeo Moriki, and Akira Fukumitsu, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 7, 1982, Ser. No. 376,136
Claims priority, application Japan, May 9, 1981, 56-69830
Int. Cl.³ G11B 3/36, 17/04
U.S. Cl. 369—77.2 7 Claims



1. A disc reproducing apparatus into which a disc is inserted by insertion of a casing housing the disc therein and from which the disc is removed by insertion of an empty casing thereinto,

said reproducing apparatus comprising:

a turntable which is vertically movable;

turntable driving means for moving said turntable to an upper position in a reproducing condition and for moving

said turntable to a lower position in a nonreproducing condition;

a cartridge which has a stylus for picking up signals recorded on said disc in the reproducing condition and which is movable between a reproduction start position and a reproduction end position;

cartridge driving means, with a motor, for driving said cartridge by driving force of said motor; and

holding means for holding said cartridge at the start position in the nonreproducing condition,

said cartridge driving mans including a clutch means which transmits the driving force of said motor to said cartridge when said turntable is located at the upper position, and which does not transmit the driving force of said motor to said cartridge to render said cartridge free to move when said turntable is positioned at the lower position;

said cartridge being restored to the start position through engagement of the empty casing with said cartridge upon insertion of the empty casing; and

said holding means including an engaging mechanism which engages with said cartridge at the start position to securely hold said cartridge in position when said turntable is located at the lower position and which does not engage with said cartridge to render said cartridge to be released from the condition where the cartridge is held in its position when said turntable is located at the upper position.

4,426,696

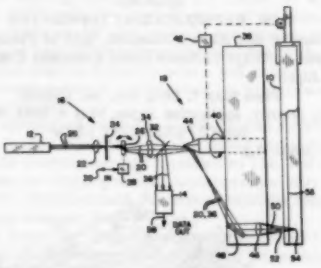
OPTICAL PLAYBACK APPARATUS FOCUSING SYSTEM FOR PRODUCING A PRESCRIBED ENERGY DISTRIBUTION ALONG AN AXIAL FOCAL ZONE

Byron B. Brenden, and James T. Russell, both of Richland, Wash., assignors to Digital Recording Corp., Wilton, Conn.

Filed Jan. 7, 1981, Ser. No. 223,229

Int. Cl.³ G02B *27/17*

U.S. Cl. 369—112 **7 Claims**



1. An energy focusing system for focusing energy to a line extending between two different points with a predetermined intensity distribution K(U) along said line, the system comprising:

a focusing element including focusing means defining a curved figure of revolution about an axis; and

energy emitting means defining a point source for emitting energy having an axially symmetric intensity distribution f(ρ) along said axis;

said figure of revolution having a shape determined by intensity distribution f(ρ) in accordance with the equation

$$\int_{U(o)}^{U(\rho)} \frac{dU}{K(U)} = 2\pi \int_{o}^{\rho} \rho f(\rho) d\rho$$

such that the focusing means is operable to focus at least a portion of said energy to said line with said predetermined intensity distribution;

U(ρ) being a variable defining a distance along the axis from the focusing element to a point at which said portion of energy is focused by a zone of said element at a radial distance ρ from the axis; and

U(o) being the focal point for energy from said source incident on said element at ρ=0.

4,426,697

BUS SYSTEM WITH ADDRESS AND STATUS CONDUCTORS

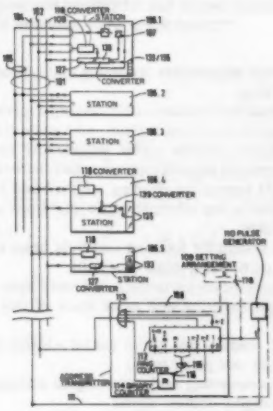
Hans Petersen, Fürth-Burgfarrnbach, and Kurt Stegmann, Nuremberg, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jun. 24, 1981, Ser. No. 276,915

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023880; May 7, 1981, 3117983

Int. Cl.³ H04J *6/00*

U.S. Cl. 370—85 **11 Claims**



1. In a bus system including an address conductor and a status conductor; mutually parallel stations having programmable address decoders, status decoders and status encoders connected to said conductors, said address conductor carrying a sequence of address informations and said status conductor carrying status informations timewise associated therewith; the improvement comprising: said address conductor carrying mutually spaced, serially binary coded bit patterns of, respectively, m-address bits; and said status conductor carrying a serialized bit pattern of r-status bits offset relative to the address bit pattern m.

4,426,698

TELEVISION DIGITAL DATA FRAME WITH ERROR DETECTION

Robert W. Pargee, Jr., San Clemente, Calif., assignor to Eeco Incorporated, Santa Ana, Calif.

Filed Aug. 24, 1981, Ser. No. 295,955

Int. Cl.³ G06F *11/10*; H04L *1/10*

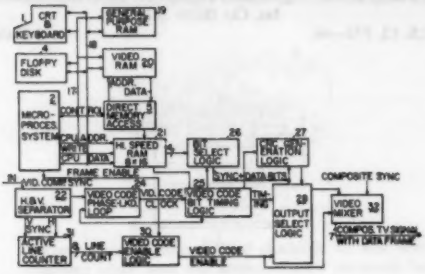
U.S. Cl. 371—37 **8 Claims**

1. The method of communicating digital information that includes the method steps of;

(a) entering into storage at sub-video speed said digital inforamtion in an amount up to and including that amount sufficient to fill the lines of a television field,

(b) formulating a standard video signal synchronizing format,

(c) subsequently recalling said digital information in television field sequence at video speed, save at those times occupied by said standard video signal synchronizing format,
(d) inserting check bits at the ends of line of the digital information of said field sequence,
(e) redundantly repeating the recalled said digital information in the next field sequence to formulate a redundant digital information module contained within a single television frame,



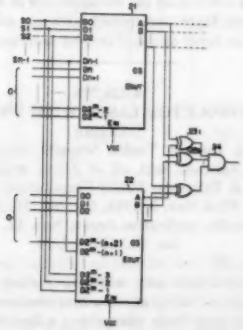
(f) transmitting the field sequences,
(g) receiving said field sequences,
(h) recovering said digital information from said field sequences,
(i) determing the validity of said received field sequence digital information by discerning the status of said check bits, and
(j) storing only valid lines of digital information of received field sequences, as determined by said check bits.

4,426,699

APPARATUS FOR DETECTING SINGLE EVENT

Eiichi Tanaka, Mitaka; Norimasa Nohara; Takehiro Tomitani, both of Chiba, and Mineki Nishikawa, Otawara, all of Japan, assignors to The Director of the National Institute of Radiological Sciences, Science and Technology Agency and Tokyo Shibaura Denki Kabushiki Kaisha, both of, Japan

Filed Feb. 28, 1980, Ser. No. 125,572
Claims priority, application Japan, Mar. 2, 1979, 54-24152
Int. Cl.³ G06F *11/30*; H03K *13/32, 19/21*
U.S. Cl. 371—68 **4 Claims**



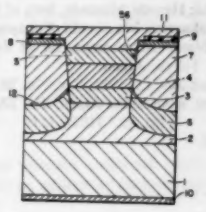
1. A logic circuit comprising a first priority encoder satisfying a condition $2^{m-1}<n\leqq 2^m$ for n binary logic input signals and having a plurality of input terminals to which said n binary logic input signals are applied according to input priority orders i (i=0 to 2^m-1) respectively, whereby an input signal corresponding to the highest priority is converted into a binary code signal constituted by a plurality of significant bits; a second priority encoder satisfying the same condition of said first priority encoder and having a plurality of input terminals to which said binary logic input signals are applied according to priority orders 2^m1-i respectively, whereby an input signal corresponding to the highest priority is converted into a binary code signal constituted by a plurality of significant bits; and a gate circuit section for bitwise comparison of the binary code signals from said first and second priority encoders and for producing an output signal only when the contents of every corresponding pair of significant bits differ from each other thereby detecting a single event of the n binary logic signals on the input lines.

4,426,700

SEMICONDUCTOR LASER DEVICE

Motohisa Hirao, Tokyo; Atsutoshi Doi, Ohme; Michiharu Nakamura, Hinodemachi; Shinji Tsuji, Kokubunji, and Takao Mori, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1981, Ser. No. 260,744
Claims priority, application Japan, May 9, 1980, 55-60619
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—45 **6 Claims**

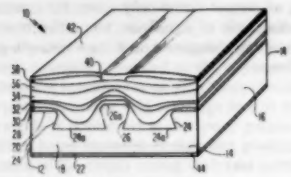


1. In a semiconductor laser device including:
a mesa-shaped optical confinement region providing an optical cavity for laser light disposed on a predetermined semiconductor substrate and having an active layer and a clad layer and a crystal surface;
a burying layer having a crystal surface burying both sides, in the direction crossing the travelling direction of the laser light, of said mesa-shaped optical confinement region;
first and second semiconductor layers for protecting said crystal surfaces, disposed on said mesa-shaped optical confinement region and on said burying layer, respectively;
said first and second semiconductor layers made of a material having a forbidden band gap smaller than those of semiconductor layers to be disposed therebelow;
a first electrode disposed on the upper part of said mesa-shaped optical confinement region contacting at least said first semiconductor layer; and
a second electrode disposed on the lower side of said semiconductor substrate,
the improvement comprising said first and second semiconductor layers located at different levels so that the upper surface of one of said semiconductor layers is below the lower surface of the other semiconductor layer whereby said first and second semiconductor layers will therefore not come into contact with each other.

4,426,701
CONSTRICTED DOUBLE HETEROSTRUCTURE SEMICONDUCTOR LASER

Dan Botez, Mt. Holly, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1981, Ser. No. 333,767
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 11 Claims



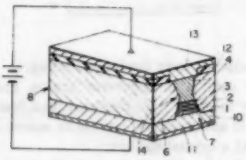
1. In a semiconductor laser comprising a substrate having a pair of opposed major surfaces and a pair of substantially parallel grooves in a first major surface thereof with a mesa therebetween, and an active layer overlying the first major surface of the substrate, the grooves and the surface of the mesa;

the improvement comprising a mesa having a height above the bottom of the grooves different from that of the first major surface of the substrate.

4,426,702
SEMICONDUCTOR LASER DEVICE

Shigeo Yamashita; Hiroshi Matsuda, both of Hachioji; Uichiroo Kobayashi, Takasaki; Masayoshi Kobayashi, Hachioji, and Hisao Nakashima, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,791
Claims priority, application Japan, Jul. 23, 1980, 55-99918
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 10 Claims

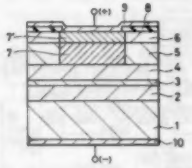


1. In a semiconductor laser device wherein at least first, second, third and fourth semiconductor layers are stacked on a predetermined semiconductor body; the second semiconductor layer is an optical guide low in refractive index relative to the third semiconductor layer; the first and fourth semiconductor layers are low in refractive indices relative to both the second and third semiconductor layers, and have conductivity types opposite to each other; the fourth and second semiconductor layers are great in band gaps relative to the third semiconductor layer; side surfaces of the first, second, third and fourth semiconductor layers parallel to a traveling direction of laser radiation are buried by a fifth semiconductor layer; a refractive index of the fifth semiconductor layer is at least lower than that of the third semiconductor layer; and a band gap of the fifth semiconductor layer is at least greater than that of the third semiconductor layer, the improvement comprising the layers being formed in a mesa-shaped semiconductor material assembly, constructed of at least said first, second, third and fourth semiconductor layers, said assembly having a varying width in the direction of the stacked layers thereof, the narrowest part of the mesa lying on the side of said third semiconductor layer opposite the side of said second semiconductor layer.

4,426,703
SEMICONDUCTOR LASER DEVICE

Takao Kuroda, Kokubunji; Takashi Kajimura; Jun-ichi Umeda, both of Hachioji, and Katsutoshi Saito, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 9, 1981, Ser. No. 272,039
Claims priority, application Japan, Jun. 20, 1980, 55/82881
Int. Cl.³ H01S 3/19
U.S. Cl. 372—46 8 Claims



1. In a semiconductor laser device comprising:

(a) a substrate;

(b) a plurality of semiconductor layers disposed on said substrate including:

(1) a first semiconductor layer having an active region;

(2) a second semiconductor layer disposed over and in contact with said first semiconductor layer; and

(3) a surface semiconductor layer over said second semiconductor layer;

(c) a stripe shaped impurity diffused region in at least parts of said semiconductor layers extending from the outer surface of said surface semiconductor layer to said second semiconductor layer to a depth in the vicinity of said first semiconductor layer, said impurity diffused region having the same conductivity type as that of the second semiconductor layer;

(d) an electrode disposed on said impurity diffused region at the outer surface of said surface semiconductor layer so that current may flow from said electrode to said first semiconductor layer through the impurity diffused region, the improvement comprising:

(e) a third semiconductor layer selected to have a diffusion rate for the impurity used in said impurity diffused region which is lower than the diffusion rate in said second semiconductor layer, interposed between said surface semiconductor layer and said second semiconductor layer.

4,426,704
SEMICONDUCTOR LASER WITH TWO ACTIVE LAYERS

Haruo Nagai, Tanashi; Yoshio Noguchi, Higashikurume, and Kenichiro Takahei, Seki, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Nov. 2, 1981, Ser. No. 317,592
Claims priority, application Japan, Nov. 11, 1980, 55-158732
Int. Cl.³ H01S 3/19
U.S. Cl. 372—50 19 Claims

1. A semiconductor laser which comprises:

a semiconductor substrate of a first conductivity type;

a laminated layer body comprising a first cladding layer of the first conductivity type, a first active layer, a second cladding layer of a second conductivity type opposite to said first conductivity type, a second active layer and a third cladding layer of the first conductivity type all laminated in the order mentioned on a prescribed region of the surface of said semiconductor substrate as counted from

said surface, both of the end surfaces of said laminated layer body comprising mirrors to form a resonant cavity;

a burying laminated layer body which is formed on the semiconductor substrate so as to surround and contact with said laminated layer body, said burying laminated layer body comprising a first burying layer, a semiconductor electrode layer of the second conductivity type and a second burying layer all laminated in the order mentioned as counted from said semiconductor substrate;

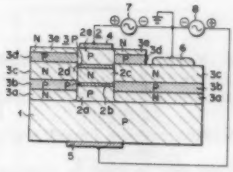
said semiconductor electrode layer substantially contacting said second cladding layer to provide a current path for a current flowing from a third electrode to said second cladding layer, and said semiconductor electrode layer having a low specific resistivity;

a first electrode coupled to said third cladding layer;

a second electrode coupled to said semiconductor substrate;

said third electrode being coupled to said semiconductor electrode layer; and

power supply means including a first power source coupled between said first and third electrodes, and a second power source coupled between said second and third electrodes.

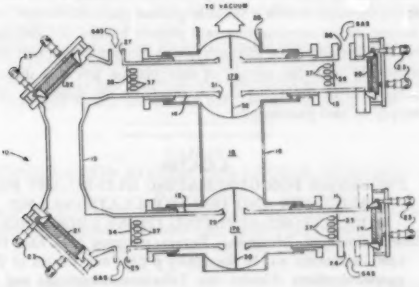


4,426,705

DOUBLE ELECTRIC DISCHARGE COAXIAL LASER

Donald F. Stevison, New Carlisle, and Edmund J. Rolinski, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1981, Ser. No. 308,975
Int. Cl.³ H01S *3/09*
U.S. Cl. 372—58 **3 Claims**



1. An electric discharge coaxial gas laser device, comprising:

a. a generally U-shaped laser discharge tube defining a pair of juxtaposed laser discharge cavities;

b. means defining a generally U-shaped optical resonant cavity and lasing axis within said discharge tube and coaxial with said discharge cavities;

c. means for supplying gaseous laser medium to each said laser discharge cavity;

d. means for exhausting said medium from each said laser discharge cavity;

e. means for sustaining a laser discharge in each said laser discharge cavity; and

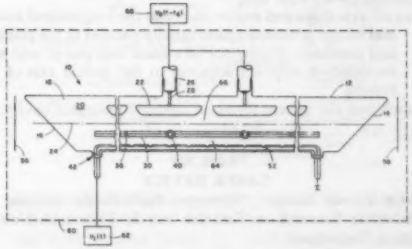
f. means defining a chamber through which said laser discharge cavities intercommunicate near their respective centers, whereby the volume of said laser medium subject to discharge is substantially increased resulting in mutual reinforcement of the said laser discharges.

4,426,706

MOLECULAR EXCIMER GAS UV PREIONIZED TRANSVERSE DISCHARGE LASER TUBE ASSEMBLY

Chi S. Liu, Monroeville; Roy K. Williams, Murrysville; Lee R. Jasper, Irwin, and Norman A. Hensler, Pittsburgh, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 16, 1981, Ser. No. 331,109
Int. Cl.³ H01S *3/097*
U.S. Cl. 372—86 **7 Claims**



1. A corrosion resistant uniformly excited UV preionized transverse discharge molecular excimer gas laser tube assembly, comprising:

a first quartz tube;

a pair of quartz optical-quality windows sealed one at each end to said quartz tube at the Brewster angle forming an enclosure;

a molecular excimer laser gas mixture disposed within said enclosure;

a molybdenum cathode;

means including a quartz/molybdenum cup sealed to the first quartz tube for mechanically supporting said molybdenum cathode within said enclosure such that the longitudinal axis of said molybdenum cathode is to one side of and substantially parallel to the longitudinal axis of said first quartz tube and for providing an electrical connection to said molybdenum cathode;

a molybdenum anode;

means for supporting said molybdenum anode within said enclosure such that the longitudinal axis of said molybdenum anode is to the other side of and substantially parallel to the longitudinal axis of said first quartz tube and for providing an electrical connection to said molybdenum anode; and

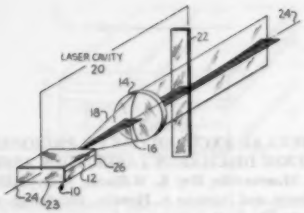
a preionizer assembly disposed within said enclosure, said preionizer assembly comprising a molybdenum ribbon sealed in a second quartz tube and having along an edge thereof a plurality of spaced "V" cut slots therealong, said "V" cut slots extending partially through the wall of said second quartz tube in such a way as to form a corresponding plurality of molybdenum ribbon segments therein.

4,426,707

SINGLE MODE CAVITY LASER

Danny W. Martin, St. Charles, and Joseph L. Levy, University City, both of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 9, 1981, Ser. No. 319,196
Int. Cl.³ H01S 3/08
U.S. Cl. 372—95 11 Claims



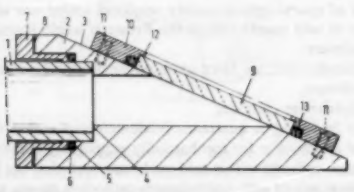
1. An external cavity laser system comprising:
means for generating a beam of coherent light comprising a laser diode gain medium having a high reflectivity back surface;
an intracavity lens; and,
an off-axis stripe end mirror such that the longitudinal axis of said mirror is oriented substantially parallel to the plane of said maximum divergence of a beam and one of said mirror edges is disposed adjacent to the optical axis of the system,
such that the system forms an unstable resonator cavity.

4,426,708

LASER DEVICE

Albert F. van Etteger, Nijmegen, Netherlands, assignor to Stichting Research en Techniek van de Katholieke Universiteit, Netherlands

Filed Sep. 2, 1981, Ser. No. 298,798
Claims priority, application Netherlands, Sep. 5, 1980, 8005038
Int. Cl.³ H01S 3/08
U.S. Cl. 372—103 2 Claims



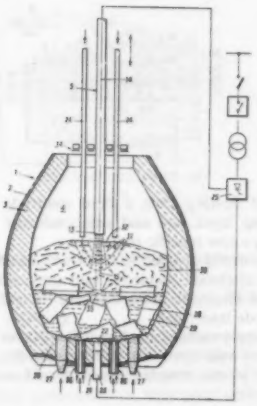
1. A laser device comprising a tubular cavity containing a gaseous or vaporous material capable of exhibiting laser activity, which cavity is provided at both ends with a window consisting essentially of a plate of suitable, radiation-transmissive material, each window being sealingly secured by means of an O-ring to the respective end face of the cavity so as to seal said cavity, characterized in that the radiation-transmissive plate of each window rests directly on the associated end face of said cavity and is held against said end face by a retaining means in the form of a frame surrounding the window plate and secured by suitable attaching means to the end face of the cavity, which frame has its surface remote from said end face provided with a flange extending inwardly to overlie the periphery of the window plate and has its surface facing said end face provided with a recess located at its inner edge surrounding the side edge of the window plate, which recess is adapted to receive said O-ring, such that the O-ring sealingly bears against the side edge of the window plate.

4,426,709

ARRANGEMENT FOR THE PRODUCTION OF STEEL

Josef Fegerl, and Walter Lugscheider, both of Linz, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Dec. 15, 1982, Ser. No. 450,007
Claims priority, application Austria, Dec. 23, 1981, 5533-81
Int. Cl.³ F27B 14/06
U.S. Cl. 373—22 19 Claims



1. In an apparatus for producing steel of materials charged, such as pig iron, heavy scrap and light scrap, said apparatus including a refining vessel having a bottom and a refractory lining, a heating-refining arrangement positioned in said refining vessel, and means for raising and lowering said heating-refining arrangement relative to said refining vessel, the improvement wherein a counter-electrode is arranged in said bottom of said refining vessel, and said heating-refining arrangement comprises a plasma burner, said plasma burner comprising a central electrode, and a first jacket immediately surrounding said central electrode and defining a first annular space through which a suitable plasma gas is delivered, and a second jacket surrounding said plasma burner and defining a second annular space through which oxygen is supplied simultaneously with the supply of said plasma gas in a direction parallel to or diverging outwardly from the direction of the supply of said plasma gas.

4,426,710

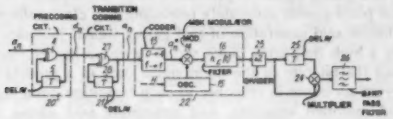
PROCESSES FOR GENERATING DUO-BINARY FSK, TAMED FSK AND TFM MODULATIONS AND MODULATORS APPLYING THOSE PROCESSES

Daniel Pommier, Mordelles, France, assignor to L'Etat Francais, represente par le Secretaire d'Etat aux Postes et Telecommunications (Centre des Telecommunications) and National d'Etudes and Etablissement Publie de Diffusion dit "Telediffusion de France", both of, France

Filed Sep. 17, 1981, Ser. No. 303,128
Claims priority, application France, Sep. 24, 1980, 80 20867
Int. Cl.³ H04L 27/12
U.S. Cl. 375—18 7 Claims

1. A process for generating a duo-binary FSK modulation comprising the steps of: first applying to a modulating binary signal train a 3- state partial response precoding, second applying to the precoded signal a coding by transition, third applying to the resulting transition coded signal a simplified MSK modulation at the carrier frequency, fourth dividing by two

the modulated signal of the first step, and fifth applying to the modulated signal divided by two, a multiplication by the same



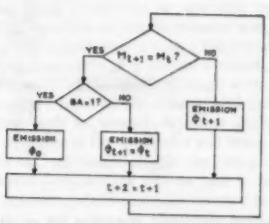
modulated signal with a divided frequency delayed by one period of binary element.

4,426,711

PROCESS FOR THE TRANSMISSION OF SERVICE SIGNALS FOR A DIGITAL RADIO BEAM, AS WELL AS TRANSMITTER AND RECEIVER FOR USING SUCH A PROCESS

Alain Huriau, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 6, 1981, Ser. No. 318,797
Claims priority, application France, Nov. 21, 1980, 80 24802
Int. Cl.³ H04B *1/66*
U.S. Cl. 375—17 **7 Claims**



1. A process for the transmission of service signals of a digital radio beam, of the type consisting of transmitting data words of m bits (m being an integer exceeding 1) comprising the steps of;

modulating a carrier according to $n=2^m$ states;

transmitting the service signals bit by bit using an n+1 state of the carrier which is transmitted in place of the state corresponding to a data word when the latter is identical to that preceding it; and

distinguishing between the two possible values of the service bit to be transmitted by using the n+1 state for coding one of its values and the state corresponding to the data word replaced by the service bit for coding the other value.

4,426,712

CORRELATION SYSTEM FOR GLOBAL POSITION RECEIVER

George Gorski-Popiel, Chelmsford, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 22, 1981, Ser. No. 266,679
Int. Cl.³ H04K *1/04*
U.S. Cl. 375—96 **7 Claims**

1. A receiver for receiving and interpreting superimposed signals originating from a plurality of sources, the signals each comprising a code portion identifying the specific source and a data portion transmitting information.

the codes being chosen such that when the receiver correlates the code portion of a signal from a particular source with a matching code stored in a memory in the receiver a substantially increased signal is accumulated while all other accumulations between the signal and other stored codes remain substantially below true correlation levels, the receiver comprising:

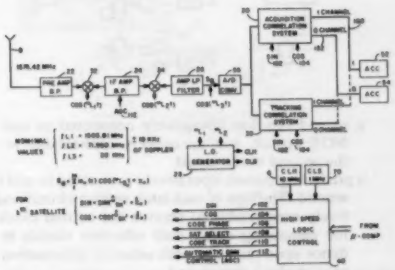
(a) down-converting means for converting the superimposed signals to a lower frequency, base band signal, the base band signal comprising each of the signals from the separate sources, their individual frequencies having been shifted by differing amounts as a result of Doppler and interference effects;

(b) an analog-to-digital conversion means for quantizing the base band signal into a string of chips having binary values;

(c) memory means for storing the codes which identify each of the sources; and

(d) faster-than-real-time correlation means for correlating the code portions of individual signals with matching codes stored in the memory means and, thus, identifying available sources so that data can be extracted, the correlation means connected to the conversion means to receive the binary chips and connected to the memory means to receive particular codes upon request, the correlation means comprising:

(i) a high-speed sampling means for multiple sampling each chip during its duration;



(ii) a variable frequency shifting means for shifting the frequency of stored code sequences;

(iii) multiplication means for multiplying the frequency shifted stored codes by a sequence of chip values taken from the high-speed sampling means;

(iv) accumulator means for accumulating the products of multiplication means; and

(v) control means for requesting particular codes, varying their frequency and sequence so that by repeated faster-than-real-time sampling of the digitally-converted, base band signal, the code portion of a signal from a particular source can be correlated with a particular code, thus, permitting the receiver to operate as if it had a plurality of virtual channels whereby each of the plurality of virtual channels can track one of the superimposed signals from the plurality of sources as identified by its code and receive the data portion of the signal transmitted therefrom.

4,426,713

SYNCHRONIZING CIRCUIT

Kazuyuki Shimizu, Machida, and Minoru Koshino, Yokohama, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 18, 1981, Ser. No. 303,589
Claims priority, application Japan, Sep. 27, 1980, 55-133681
Int. Cl.³ H04L *7/06*
U.S. Cl. 375—106 **11 Claims**

1. A synchronizing circuit operatively connectable to receive an unsynchronized signal and first and second clock signals, and for generating a synchronized signal, comprising:

a pilot signal generating circuit, comprising a pilot flip-flop operatively connectable to receive the first clock signal, for generating a pilot signal in dependence on the first clock signal;

a latch setting circuit, operatively connected to said pilot flip-flop of said pilot signal generating circuit and opera-

tively connectable to receive the second clock signal, for storing the pilot signal as delay path selection information in dependence upon a phase difference between the first and second clock signals, said latch setting circuit comprising:

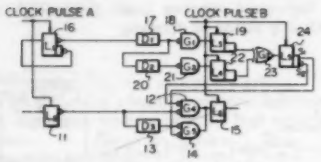
a first delay circuit operatively connected to said pilot flip-flop;

a second delay circuit operatively connected to said first delay circuit;

a first NOT circuit operatively connected to said first delay circuit;

a second NOT circuit operatively connected to said second delay circuit;

a first flip-flop operatively connected to said first NOT circuit, and operatively connectable to receive the second clock signal; and



a second flip-flop operatively connected to said second NOT circuit, and operatively connectable to receive the second clock signal;

a predicting circuit, operatively connected to said first and second flip-flops of said latch setting circuit and operatively connectable to receive the second clock signal, for generating delay path selection signals in dependence upon the delay path selection information and the second clock signal; and

a signal transmission circuit, operatively connected to said predicting circuit and operatively connectable to receive the unsynchronized signal and the first and second clock signals, for generating the synchronized signal in dependence upon the delay path selection signals, the first and second clock signals and the unsynchronized signal.

4,426,714

CLOCK SIGNAL DERIVATION SYSTEM

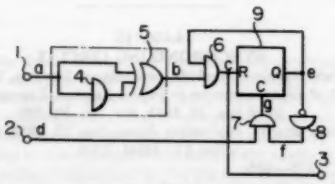
Akira Ashida, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1981, Ser. No. 229,755

Claims priority, application Japan, Jan. 29, 1980, 55-8306

Int. Cl.³ H04L 7/00; H03K 5/156

U.S. Cl. 375—110 6 Claims



1. A clock signal derivation method for deriving clock information from input signal data encoded by a code having a clock frequency of twice the bit rate of said input signal data comprising the steps of producing a sequence of transition point signals representing transition points on the waveform of said input signal, generating gating signals lasting for greater than 50% of one bit period of the encoded data of said input signal and less than 100% of said one bit period from the generation of a transition point signal, and inhibiting transition point signals of said sequence which occur during generation of said gating signals to produce a modified sequence of transition point signals accurately providing said clock information, wherein said generation of said gating signals includes counting a high frequency clock signal having a higher frequency than the bit rate of the input signal data to a predetermined maximum count in response to each transition point signal of said modified sequence, and generating said gating signals during said counting and until said maximum count is reached.

4,426,715

RADIATION DIAGNOSTIC APPARATUS

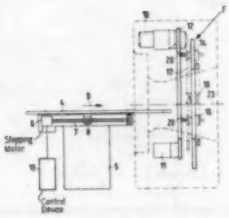
Ulrich Baer, Nuremberg; Walter Distler, Erlangen-Dechsendorf, and Peter Grassmann, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,137

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126643

Int. Cl.³ A61B 6/02

U.S. Cl. 378—4 1 Claim



1. Radiation diagnostic apparatus for producing transverse layer images of a radiography subject, comprising a patient support, a radiation source which generates a radiation beam penetrating the radiography subject, a radiation receiver which converts the radiation intensity behind the subject into electric signals, a measurand converter for the conversion of the electric signals supplied by the radiation receiver into an optically visible image, and a rotating frame assembly on which the radiation source is mounted and which, for the purpose of scanning the radiography subject from various directions, is rotatably mounted about an axis extending in a longitudinal direction generally longitudinally of the patient support, characterized in that the rotating frame assembly comprises a carrier for the X-ray source which is adjustably mounted for movement in the longitudinal direction, characterized in that driving means for the movement of the patient support and the carrier of the rotating frame assembly in the longitudinal direction are so designed that the patient support and the X-ray source, during its rotation with the rotating frame assembly, are moved longitudinally with the same speed, and that, following termination of this rotation, the return of the carrier into an initial position proceeds with a higher speed.

4,426,716

DENTAL X-RAY DIAGNOSTIC INSTALLATION

Manfred Muether, and Ernest-August Behne, both of Bensheim, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 28, 1980, Ser. No. 211,404

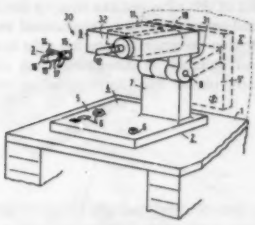
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1979, 2949199

Int. Cl.³ G03B 41/16

U.S. Cl. 378—38 10 Claims

1. In a dental x-ray diagnostic installation comprising an x-ray apparatus having an x-ray tube having an applicator

receivable orally in a patient's mouth for directing x-rays thereform, the improvements comprising means for enabling the patient to control the insertion and position of the applicator in the patient's mouth, said means including a bite-on part and a mounting structure for the x-ray apparatus, said mounting structure having a support part having means for mounting said support part on a support surface, a housing containing said x-ray tube with the applicator extending from a front surface of the housing, and means for pivotably connecting said housing on said support part for pivotable movement on a horizontal axis and including one of said part and housing supporting an axle on a horizontal axis and the other of said



part and housing being connected to said axle by bearing means for enabling rotation on said horizontal axis, and said bite-on part including a guide sleeve with a bite piece mounted thereon and being receivable in a patient's mouth, said bite piece having a shape of an average jaw shape with a contour for receiving the front teeth of the patient, said guide sleeve having an opening with an interior diameter slightly larger than an exterior diameter of the applicator and being telescopically received on said applicator so that the biting of the bite piece by the patient positions the bite-on part in the desired position as the applicator is telescopically inserted in the guide sleeve.

4,426,717

MEASURING APPARATUS FOR X-RAY FLUORESCENCE ANALYSIS

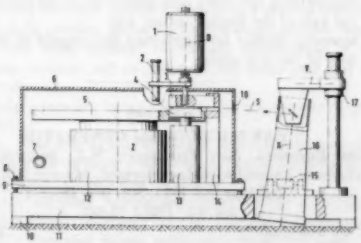
Joachim Schwenke, Escheburg; Joachim Knoth, Hamburg; Rainer Marten, and Herbert Rosomm, both of Geesthacht, all of Fed. Rep. of Germany, assignors to Gesellschaft für Kernenergieverwertung in Schiffbau und Schiffahrt mbH, Geesthacht-Tesperhude, Fed. Rep. of Germany

Continuation of Ser. No. 933,883, Aug. 15, 1978, abandoned. This application Mar. 24, 1980, Ser. No. 133,556

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2736960

Int. Cl.³ G01N *23/22*

U.S. Cl. 378—45 **3 Claims**



1. A method of analyzing a specimen with a beam of X-ray radiation by detecting fluorescent radiation emitted by the specimen, the method comprising the steps of:

positioning the sample in alignment with a fluorescent radiation detector and in juxtaposition with a reflector plate having a reflecting surface;

directing a beam of X-ray radiation having high and low energy components toward the reflecting surface at a shallow angle of incidence with respect thereto;

absorbing the high-energy components of the beam in the reflector plate while reflecting the low-energy components of the beam from the reflector plate onto the specimen by selecting an appropriate angle of incidence, and

detecting the fluorescent radiation emitted by the specimen due to impingement of the low-energy components on the specimen with the fluorescent radiation detector.

4,426,718

X-RAY DIFFRACTION APPARATUS

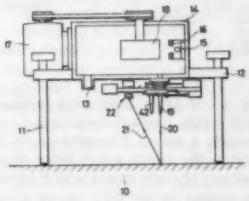
Makoto Hayashi; Shinji Sakata, and Tasuku Shimizu, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,787

Claims priority, application Japan, Sep. 1, 1980, 55-119774

Int. Cl.³ G01N *23/20*

U.S. Cl. 378—072 **7 Claims**



1. An X-ray diffraction apparatus comprising: means for radiating a micro-beam of X-rays to a material; means capable of detecting the position and intensity distribution of diffracted X-ray from said material; means for obtaining the total misorientation or the diameter of a crystal subgrain on the basis of a signal of said diffracted X-ray detecting means; and means for obtaining the creep life consumption factor of said material from the relationship between the total strain and the loading time under the creep state that is in advance obtained for the same material.

4,426,719

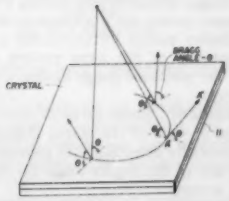
PRODUCTION OF MONOCHROMATIC X-RAY IMAGES OF X-RAY SOURCES AND SPACE RESOLVING X-RAY SPECTRA

Benjamin S. Fraenkel, Jerusalem, Israel, assignor to Yissum Research Development Co. of the Hebrew University of Jerusalem, Jerusalem, Israel

Filed Feb. 12, 1981, Ser. No. 234,510

Int. Cl.³ G01B *15/00*

U.S. Cl. 378—70 **11 Claims**



1. A crystal for use in space-resolving x-ray spectroscopy, comprising:

a crystal capable of double reflection, curved in the manner of the crystal of a curved crystal x-ray spectrometer, wherein the curvature of said crystal is such that the plane of double reflection is perpendicular to the axis of the cylindrical curvature of the crystal.

4,426,720

DRIVE FOR ROTARY ANODES OF X-RAY TUBES

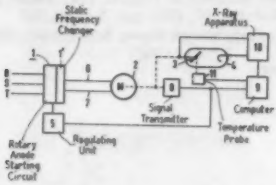
Rudolf Friedel, Kleinseebach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,672

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1980, 3021048

Int. Cl.³ H05G *1/70*

U.S. Cl. 378—93 **5 Claims**



1. A rotary anode drive system comprising an X-ray tube having a rotary anode, a rotary anode drive motor for driving said rotary anode, a circuit arrangement for the supply of a supply voltage to the rotary anode drive motor including at least one frequency changer means which varies the frequency of the supply voltage for the drive motor in comparison with the mains frequency, and a control circuit controlling said frequency changer means for increasing the rotational rate of the rotary anode drive motor by increasing the frequency of the supply voltage, said control circuit comprising thermal load determining means producing a control signal which varies as a function of time according to the variation in the thermal load on the rotary anode during operation of the X-ray tube, said thermal load determining means being connected with said frequency changer means for supplying said control signal to said frequency changer means to increase the rotational rate of the drive motor as a function of increasing thermal load on the rotary anode during operation of the X-ray tube.

4,426,721

X-RAY INTENSIFIER DETECTOR SYSTEM FOR X-RAY ELECTRONIC RADIOGRAPHY

Shih-Ping Wang, Los Altos, Calif., assignor to Diagnostic Information, Inc., Sunnyvale, Calif.

Filed Oct. 7, 1980, Ser. No. 194,909

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—99 **23 Claims**

1. An x-ray intensifier detector system for an x-ray fan beam, the detector system comprising:

an x-ray image intensifier tube having a continuous strip of x-ray input screen and a continuous strip of output phosphor display screen for producing a light strip image representative of the x-ray pattern striking the input screen, the produced image having a longitudinal axis of symmetry,

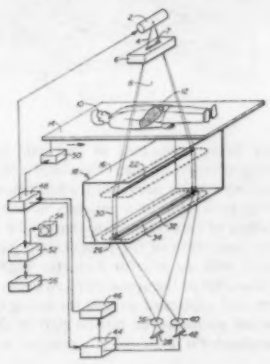
a first, scannable , linear array of discrete light detectors arranged in view of the output phosphor display screen for sequentially detecting light generated along the longitudinal axis of the display image on the output phosphor display screen,

a second, scannable, linear array of discrete light detectors in view of the output phosphor display screen for sequentially detecting light generated on the output phosphor display screen along a hypothetical line which is parallel to the longitudinal axis of the display image and spaced from it by a distance equal to one to ten times the full width at half maxima of the light strip image, the individual detectors of the first and second arrays having a physical correspondence to each other which is determined in part by the sequence in which they are scanned, and

a scanning display for displaying the individual differences between the outputs of corresponding detectors of the first and second arrays.

7. An x-ray intensifier detector system for detecting an x-ray fan beam, the detector system comprising:

an x-ray image intensifier tube having an input window and a display screen for producing a light strip image representative of the x-ray pattern striking the input screen, the produced image having a longitudinal axis of symmetry, and wherein the image intensifier tube is of the proximity type and includes an elongated input window strip, an elongated, planar scintillator strip, an elongated, planar



photocathode strip located immediately adjacent to the scintillator strip and between the scintillator strip and the output display screen, an output window immediately adjacent to the display screen, the display screen also being a planar strip, means for providing an electrostatic potential between the phosphor display screen and the photocathode, an evacuated housing surrounding the scintillator, the photocathode and the display screen which is closed at one end by the input window and which is closed at the other end by the output window, a metallic covering for the vacuum side of the display screen, the metallic covering being thick enough to dissipate at least one third of the kinetic energy of photoelectrons passing through it to strike the display screen;

a first, scannable, linear array of discrete light detectors for sequentially detecting light generated along the longitudinal axis of the display image; and

a scanning display for displaying the outputs of the detectors of the first array.

4,426,722

X-RAY MICROBEAM GENERATOR

Osumu Fuyimura, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.Y.

Filed Mar. 12, 1981, Ser. No. 243,331

Int. Cl.³ H01J *35/00*

U.S. Cl. 378—137 **22 Claims**

1. An x-ray microbeam generator comprising:

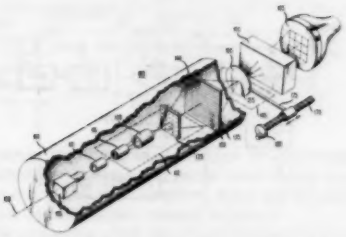
an electron source for producing an electron beam,

means for focusing said electron beam,

means for deflecting said focused electron beam,

a target responsive to the incidence of said deflected electron beam producing x-rays,

means for forming said x-rays into a microbeam directed through an examination field,
characterized in that
said target (135 or 235) comprises
an anode (140 or 240) having a plurality of spaced spots (130), said spots including material for producing x-rays responsive to the incidence of said electron beam;
said electron beam deflection means (112 or 212) comprises



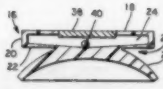
means for controlling said electron beam to impinge sequentially upon a plurality of said spots in a predetermined pattern to emit a corresponding sequence of x-rays; and
said microbeam forming means (145 or 245) comprises
means for selectively blocking said sequence of emitted x-rays so that at least one x-ray from each spot irradiates a different portion of the examination field, the location of said portions being correlated to said predetermined pattern of spots.

4,426,723

X-RAY MARKER DEVICE

James S. Rouse, 3758 Mulkey Cir. Marietta, Ga. 30060

Filed Dec. 21, 1981, Ser. No. 332,508
Int. Cl.³ G03B *41/16*
U.S. Cl. 373—22 **1 Claim**



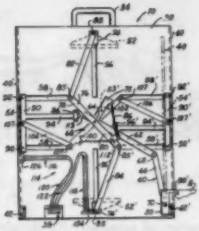
1. An x-ray marker device comprising:
a unitary member having a first side and having only a single suction cup on said first side so as to temporarily secure said member to a substantially flat surface of an x-ray film holder;
said unitary member further comprising a second side having a body member unitary with said single suction cup, so that said body member forms said second side of said unitary member and said suction cup forms said first side thereof;
said unitary member being substantially transparent to x-ray radiation;
an x-ray opaque indicium formed in said body member so as to cast a characteristic shadow on film in the film holder when subjected to x-ray radiation;
said body member having an upper surface substantially conforming in diameter to the diameter of said single suction cup and facing outwardly from the x-ray film holder, so as to minimize the size of the x-ray marker device; and
an annular groove formed on the exterior of said unitary member between said body member and said single suction cup for selectively receiving a hanger member, so as to facilitate storing said marker device when not in use.

4,426,724

X-RAY CASSETTE HOLDER

James W. Cutter, 85 Frank's Dr., Hollister, Calif. 95023

Filed Nov. 6, 1981, Ser. No. 318,737
Int. Cl.³ H05G *1/00*
U.S. Cl. 378—181 **14 Claims**



1. An X-ray cassette holder, comprising, in combination:
(a) a frame including a planar member generally rectangular in plan and defining a mid-area relative to which an associated X-ray cartridge is to be centered;
(b) first positioning means provided on said frame for moving an associated X-ray cassette in a first direction;
(c) second positioning means provided on said frame for moving an associated X-ray cassette in a second direction perpendicular to the first direction, each of said first positioning means and second positioning means including a respective pair of clamp members slideably mounted on said planar member and arranged substantially symmetrically of the mid-area for movement toward and away from one another; and
(d) actuator means connected to at least said second positioning means for moving same in the second direction as said frame is inserted into an associated X-ray machine, said actuator means including a lug slideably mounted on said frame and arranged for engaging an abutment provided on an associated X-ray machine and moveable thereby relative to said frame, and mechanism means connected to said lug and to at least said second positioning means for movement with said lug and sliding at least said clamp members of said second positioning means relative to said frame, said mechanism means including a crank pivotally mounted at said mid-area of said planar member of said frame, and a link pivotally attached to said crank and to said lug for pivoting said crank as said lug slides relative to said frame.

4,426,725

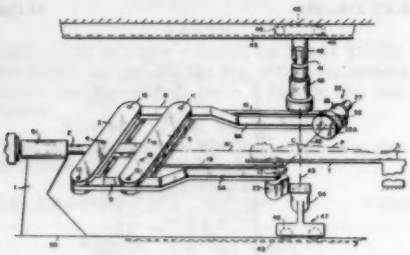
BIPLANAR VARIABLE ANGLE X-RAY EXAMINING APPARATUS

John K. Grady, 111 Slough Rd., Harvard, Mass. 01451

Continuation-in-part of Ser. No. 67,605, Aug. 20, 1979, abandoned, and a continuation-in-part of Ser. No. 148,298, May 9, 1980, abandoned. This application May 7, 1982, Ser. No. 376,109
Int. Cl.³ A61B *6/00*
U.S. Cl. 378—196 **23 Claims**

1. Radiological apparatus for radiographic examination of a subject comprising:
a first radiological examining set including first radiation source means, first radiation receptor and two-dimensional image-former means and first support means for holding the first source and receptor means on a first radiation axis; and
a second radiological examining set including second radiation source means, second radiation receptor and two-dimensional image-former means and second support means for holding the second source and receptor means on a second radiation axis aligned to intersect the first radiation

axis at a common isocenter, wherein the first support means is rotatable independently of the second support means about a rotational axis intersecting the common isocenter;



whereby a series of substantially simultaneous radio-graphic examinations can be made on both radiation axes through the subject at variable angles between the radiation axes.

4,426,726

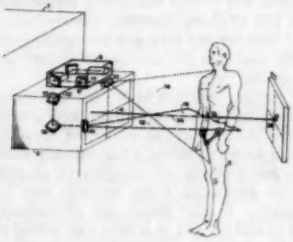
APPARATUS AND METHOD FOR X-RAY BEAM ALIGNMENT

Eric C. Cheetham, 565 4th Ave., Elizabeth, N.J. 07202

Filed Feb. 23, 1982, Ser. No. 351,417

Int. Cl.³ G01N *21/00*; G03B *41/16*

U.S. Cl. 378—206 **5 Claims**



1. For an X-ray machine having an X-ray tube, an X-ray collimator, and an X-ray film holder, an apparatus for positioning an X-ray beam in alignment with a target and the center of the X-ray film holder, comprising:

a visible light beam source attached to the X-ray collimator and providing a source beam;

a beam splitter receiving said source beam and providing a first and second indicating beam;

fan beam assembly means attached to the X-ray collimator and receiving said first and said indicating beams and providing a first fan beam and a second fan beam perpendicular to said first fan beam, wherein said first and second fan beams are directed to both the target and the center of the X-ray film holder and intersect upon the target forming a cross-hair reticle.

4,426,727

FM NOISE REDUCING CIRCUIT

Masanori Hamada, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

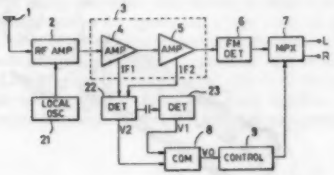
Filed Jul. 30, 1981, Ser. No. 288,551

Claims priority, application Japan, Aug. 7, 1980, 55-107676

Int. Cl.³ H04B *1/10*; H04H *5/00*

U.S. Cl. 381—13 **4 Claims**

1. An FM noise reducing circuit, comprising an FM radio receiver which includes a high frequency amplifier stage having an input to which is applied an FM input signal having right and left components and a multipath distortion component, an intermediate frequency amplifier stage connected to an output of said high frequency amplifier stage, an FM wave detecting stage connected to an output of said intermediate frequency amplifier stage and multiplexing circuit means connected to an output of said FM wave detecting stage and having at least one output; a detecting circuit which is connected to at least one output of said intermediate frequency amplifier stage and produces an IF signal level and a multipath



signal level; comparator means responsive to said detecting circuit for subtracting said multipath signal level from said IF signal level; and control means responsive to said comparator means and connected to a control input of said multiplexing circuit for causing said multiplexing circuit means to attenuate high frequency components of signals from said FM wave detecting stage and to blend said right and left components of such signals so as to effectively reduce said multipath distortion component at said output of said multiplexing circuit means.

4,426,728

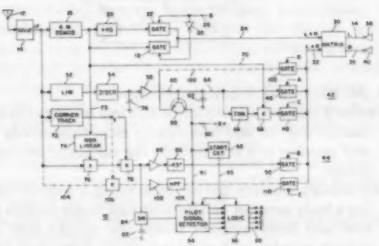
MULTIPLE SYSTEM AM STEREO RECEIVER AND PILOT SIGNAL DETECTOR

Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016

Filed Aug. 31, 1981, Ser. No. 298,230

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—15 **17 Claims**



1. In a receiver for stereophonic broadcast signals which include a modulation component comprising a pilot signal having a selected frequency characteristic, apparatus for determining the presence or absence of said pilot signal, comprising:

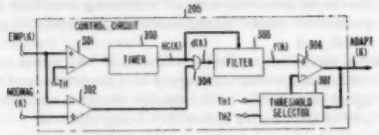
means for detecting received signal components which lie within a first band of frequencies which includes said pilot signal, and for also detecting received signal components which lie within at least one other band of frequencies located above or below said first band;

and means for evaluating the signals detected in said first and other bands, and for developing an output signal which indicates when signals in said first band exceed a first level and signals in said other band do not exceed a second level.

4,426,729
PARTIAL BAND - WHOLE BAND ENERGY DISCRIMINATOR

Charles W. K. Gritton, North Brunswick, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 5, 1981, Ser. No. 240,978
Int. Cl.³ G10L 1/00
U.S. Cl. 381—41 7 Claims



1. An energy discriminator of the type for discriminating between whole band energy and partial band energy in a received signal in a prescribed frequency band and for generating a control signal indicative thereof including,

means for generating a first signal representative of an average value of the received signal,

means for generating a second signal representative of a magnitude of the received signal, and

first means for comparing said first and second signals to generate an output signal having a first state when said second signal is equal to or greater than said first signal and a second state when said second signal is less than said first signal, characterized by,

low pass filter means having a prescribed characteristic for generating a filtered signal version of said first comparing means output signal, and

second means for comparing said filtered signal to at least one predetermined threshold value to generate a first state of the control signal indicative that whole band energy is not being received when said first filtered signal amplitude value is less than said at least one threshold value and a second state of the control signal indicative that whole band energy is being received when said filtered signal amplitude value is equal to or greater than said at least one threshold value.

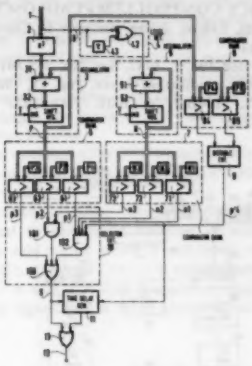
4,426,730
METHOD OF DETECTING THE PRESENCE OF SPEECH IN A TELEPHONE SIGNAL AND SPEECH DETECTOR IMPLEMENTING SAID METHOD

Dominique Lajotte, Ste Genevieve des Bois, and Francis Menet, Boulogne, both of France, assignors to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jun. 29, 1981, Ser. No. 278,236
Claims priority, application France, Jun. 27, 1980, 80 14400
Int. Cl.³ G10L 1/00
U.S. Cl. 381—46 9 Claims

1. A method for detecting the presence of speech in a telephone signal comprising the steps of:

setting a threshold having a value which decreases as the number of passages through zero level of said signal approaches 1.25 per millisecond; and

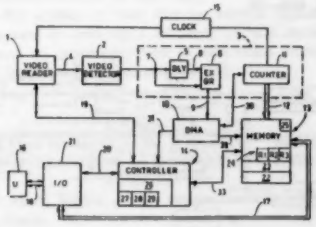


interpreting as constituting speech any signal sequence having a mean power level exceeding said threshold.

4,426,731
CHARACTER RECOGNITION EMPLOYING COMPRESSED IMAGE DATA

Olof A. Edlund, and Mats A. Enser, both of Lidingo, Sweden, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1981, Ser. No. 312,192
Claims priority, application Sweden, Oct. 21, 1980, 8007369
Int. Cl.³ G06K 9/36
U.S. Cl. 382—56 9 Claims

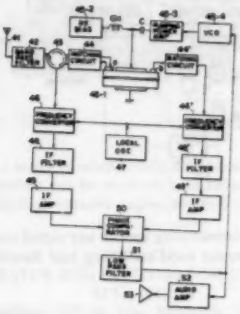


1. The method for processing video data in an optical character recognition system comprising raster scanning of a document to produce video data divided into individual scans, compressing said video data into a run-length code, storing said compressed video data, creating a first table comprising address information identifying individual scans of said stored compressed video data, expanding selected portions of said compressed video data, and processing the pattern thus expanded for character recognition.

4,426,732
RECEIVER HAVING A SURFACE ELASTIC WAVE HIGH FREQUENCY AMPLIFIER WITH A FREQUENCY-CONTROLLED PUMP OSCILLATOR

Masaharu Mori, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 385,361
Claims priority, application Japan, Jun. 11, 1981, 56-90649
Int. Cl.³ H04B 1/26; H03L 7/00; H03F 7/00
U.S. Cl. 455—263 6 Claims

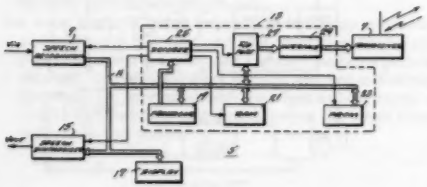


1. Receiver comprising the following means:
a surface elastic wave amplifier disposed in the high frequency amplifier stage of said receiver;
at least two output means taking out electric signals corresponding to sound waves propagating in different directions in response to input signals in said surface elastic wave amplifier;
detection means detecting phase errors or frequency errors of electric output signals of said output means;
means applying pumping electric power to said surface elastic wave amplifier; and
control means controlling the frequency of said pumping electric power in response to output of said detection means.

4,426,733
VOICE-CONTROLLED OPERATOR-INTERACTING RADIO TRANSCEIVER

Theodore Brenig, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Jan. 28, 1982, Ser. No. 343,754
Int. Cl.³ H04B 1/46
U.S. Cl. 455—79 21 Claims

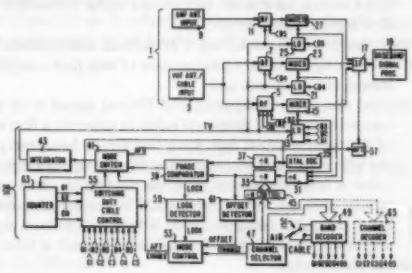


1. A voice-controlled operator-interacting radio transceiver, comprising:
radio transceiver means for transmitting and receiving radio frequency signals and having plural potential operating conditions including at least transmit, receive, volume and squelch control;
speech recognition means for receiving audible verbal phrases spoken by a human operator, for recognizing each of predetermined plural spoken phrases which define predetermined desired respectively corresponding ones of said operating conditions, and for producing a respectively corresponding predetermined control signal in response to each of said predetermined spoken phrases;
control means for controlling the operation of said radio transceiver means with respect to said operating conditions in response to a production of a corresponding one of said predetermined control signals, said control means further producing a coded data signal representative of the respective predetermined operating condition of said transceiver means corresponding to the produced control signal; and
output means responsive to said coded data signal for converting said coded data signal to a predetermined output signal perceptible to the human operator and confirmatory of the control action then being effected.

4,426,734
ARRANGEMENT USEFUL IN A PHASE LOCKED LOOP TUNING CONTROL SYSTEM FOR SELECTIVELY APPLYING AN AFT VOLTAGE IN A MANNER TO IMPROVE LOOP STABILITY

Juri Tults, Indianapolis, Ind., and Charles M. Wine, Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,885
Int. Cl.³ H04B 1/26
U.S. Cl. 455—180 10 Claims



1. A tuning system for tuning a receiver to any one of a plurality of channels in a tuning range, comprising:
means for providing a plurality of RF signals corresponding to respective channels, each of said RF signals including at least one information bearing RF carrier;
RF means for selecting one of said RF signals in response to a tuning control signal;
local oscillator means for generating a local oscillator signal and controlling its frequency in response to said tuning control signal;
mixer means for heterodyning said selected RF signal and said local oscillator signal to produce an IF signal including at least one information bearing IF carrier corresponding to the information bearing RF carrier of the selected RF signal, said IF carrier having a nominal frequency;
AFT means for producing an analog AFT signal having an amplitude magnitude and polarity representing the magnitude and sense, respectively, of the deviation of the actual frequency of said IF carrier from said nominal frequency;
channel selection control means for selecting a desired channel including comparison means responsive to said local oscillator signal for generating an error signal representing the deviation between the frequency of said local oscillator signal and a predetermined frequency corresponding to the selected channel;
conversion means for generating said tuning control signal in response to said error signal;
switch means for selectively coupling said analog AFT

signal to said conversion means in response to a switching control signal coupled to a control input, said conversion means being also responsive to said analog AFT signal to generate said tuning control signal;

switch control means coupled to said control input of said switch means for generating said switching control signal to control said switch means, said switch control means causing said switch means to be conditioned to couple said analog AFT signal to said conversion means when the deviation between the frequency of said local oscillator signal and said predetermined frequency reaches a predetermined value; and

duty cycle control means coupled to said switch control means and to said channel selection means for controlling the duty cycle of said switching control signal to determine the switching duty cycle at which said switch means couples said analog AFT signal to said conversion means in accordance with the selected channel.

4,426,735

RADIO RECEIVER COMPRISING A FREQUENCY LOCKED LOOP WITH AUDIO FREQUENCY FEEDBACK, AND A MUTING CIRCUIT

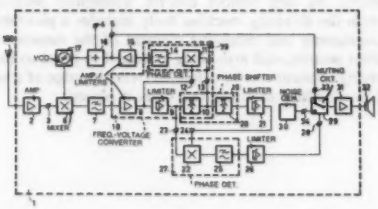
Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,553

Claims priority, application Netherlands, Sep. 4, 1979, 7906602

Int. Cl.³ H04B *1/10, 1/26*

U.S. Cl. 455—222 **8 Claims**



1. A radio receiver having a frequency-locked loop, which includes a voltage-controlled oscillator having an input for a tuning voltage, a mixer stage coupled to the voltage controlled oscillator and connected to an aerial input, a filtering element coupled to the mixer stage and a frequency-voltage converter coupled to the tuning voltage input of the voltage-controlled oscillator, characterized in that an output of the filtering element is coupled to a first input of a phase detector and, via an all-pass frequency-dependent 180° phase shifting network also to a second input of the phase detector, said all-pass frequency-dependent 180° phase shifting network shifting the phase of a signal passing there-through by an amount which depends on the frequency of said signal and is 180° for a predetermined value of said frequency, the phase-detector being coupled, by way of a limiter, to a control input of a muting circuit for blocking an audio signal unless the receiver is substantially correctly tuned to a broadcast transmission.

4,426,736

PROGRAMMABLE CLOCK RADIO HAVING NAP AND SLEEP TYPE FEATURES

Charles F. Fisler, New Hartford, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Jun. 11, 1982, Ser. No. 387,484

Int. Cl.³ H04B *1/16*

U.S. Cl. 455—231 **11 Claims**

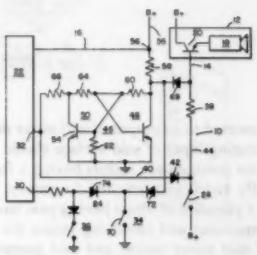
1. A programmable clock radio comprising:

radio circiuit means including a radio circuit and an input terminal, said radio circuit means operating only when a control signal of predetermined polarity and magnitude is supplied to said input terminal of said radio circuit means, and control means coupled to said input terminal of said radio circuit means for controlling operation of said radio circuit by selectively supplying a control signal to said input terminal of said radio circuit means in accordance wih the wishes of a user, said control means comprising:

timing means including input means and output means for providing a first signal at said output means for a selective time interval,

manually operated ON/OFF switch means for producing a second signal when said ON/OFF switch means is in its ON state,

circuit means operable between first and second states coupled to said input terminal of said ratio circuit means, said output means of said timing means, and said manually operated ON/OFF switch means, said circuit means in said first state adapted to supply any first or second signal that is being generated to said radio circuit means as a control signal and said circuit means in said second state adapted to block any first or second signals that is being generated from being supplied to said input terminal of said radio circuit means as control signal,



said control means further comprising manually operated time set means comprising first means coupled to said circuit means and said input of said timing means for establishing a time period during which said timing means produces a first signal at said output means of said timing means, said circuit means being responsive to operation of said first means and the subsequent generation of a first signal to assume and retain its second state throughout the established time period and to thereafter assume its first state,

whereby neither of said first or second signals can be supplied to said input terminal of said radio circuit means to cause operation of said radio circuit means during the established time period.

4,426,737

CIRCUIT FOR GENERATING A PUMPING SIGNAL FOR A SURFACE ELASTIC WAVE PARAMETRIC DEVICE IN A RECEIVER

Masaharu Mori, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,507

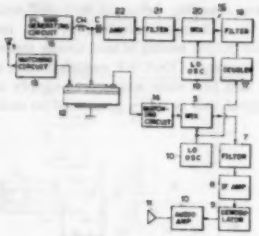
Claims priority, application Japan, Feb. 6, 1981, 56-17254; Feb. 6, 1981, 56-17255

Int. Cl.³ H04B *1/16*

U.S. Cl. 455—260 **3 Claims**

1. A receiver for receiving signals at a selected frequency, comprising a high frequency amplifier, means for supplying a high frequency signal to an input of said high frequency amplifier, a first local oscillator, and means responsive to said first local oscillator and to said high frequency amplifier for converting a high frequency signal from an output of said high

frequency amplifier to an intermediate frequency signal, said high frequency amplifier including a surface elastic wave parametric amplifier and pumping power supply means for supplying a pumping input of said surface elastic wave parametric amplifier with a pumping signal, said pumping power supply means including a frequency doubler circuit connected to said first local oscillator, a second local oscillator, mixer means for mixing an output of said second local oscillator and a signal from an output of said frequency doubler circuit, and filter



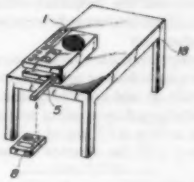
means connected to an output of said mixer means and coupled to said pumping input of said surface elastic wave parametric amplifier for passing only signals having a frequency which is substantially twice said selected frequency, said filter means including a plurality of filters having pass bands with different center frequencies and switching means for coupling to said output of said mixer means and said pumping input of said surface elastic wave parametric amplifier a respective said filter having a pass band center frequency which is substantially twice said selected frequency.

4,426,738

DICTATING MACHINE

Masanobu Sato, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jan. 28, 1981, Ser. No. 229,273
Claims priority, application Japan, Jan. 30, 1980, 55-11078[U]
Int. Cl.³ H04B 9/00
U.S. Cl. 455—603 2 Claims



1. In a dictating machine including a dictating machine body and foot control switch means including a foot switch, the improvement comprising a remote control transmitter section provided in the switch means for generating a wireless remote control signal over a certain range in response to a foot switch operation, and a remote control receiver section including a receiving element associated with the machine body for receiving the wireless remote control signal wherein said foot control switch means is unconnected to said dictating machine body and said foot control switch means controls operation of said dictating machine body when said remote control receiver section is within the range of the wireless remote control signal generated by said remote control transmitter section, and wherein the dictating machine body includes a pivotable arm for containing said receiving element of the remote control receiver section, said arm being arranged to pivot so that said receiving element can be extended over the edge of a support surface on which said machine body is placed.

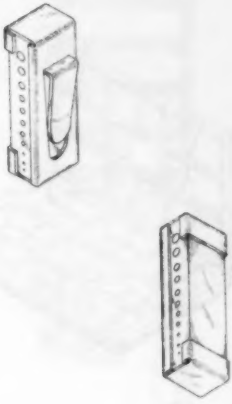
DESIGNS

JANUARY 17, 1984

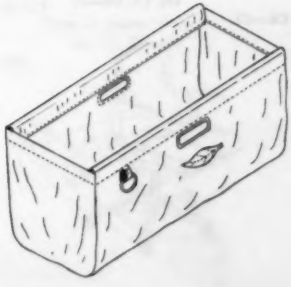
272,199
COMBINED FACE SHIELD AND HELMET OR SIMILAR ARTICLE
Thomas Rudd, Wayzata, Minn., assignor to Drag Specialties, Inc., Minneapolis, Minn.
Filed Oct. 6, 1980, Ser. No. 194,041
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—232

272,200
SHOE SOLE
James C. Autry, Dallas, and Burkle J. Carmichael, Rockwall, both of Tex., assignors to Autry Industries, Inc., Dallas, Tex.
Filed Jan. 20, 1982, Ser. No. 341,096
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

272,201
BELT MOUNTED HOLDER FOR ALLEN WRENCHES
Joseph C. Garcia, 1623 S.R. 19, Fremont, Ohio 43420
Filed Jun. 15, 1981, Ser. No. 274,057
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400



272,202
FIREWOOD CARRIER
Linda K. Ring, 12396 James Rd., Minnetonka, Minn. 55343
Filed Feb. 13, 1981, Ser. No. 234,162
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30.1



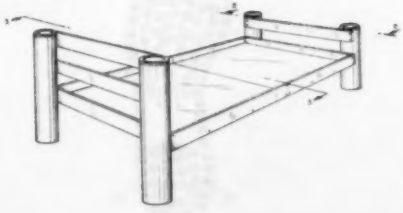
272,203
CASE FOR JEWELS
Vincent Di Bartolo, Cresskill, N.J., assignor to Mele Manufacturing Company, Inc., Utica, N.Y.
Filed Dec. 1, 1980, Ser. No. 211,686
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—75

272,204
CHAIR
Peter De Boer, Amsterdam, Netherlands, assignor to Gispen & Staalmeubel B.V., Culemborg, Netherlands
Filed Oct. 2, 1981, Ser. No. 308,031
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

272,205
CHAIR
Peter De Boer, Amsterdam, Netherlands, assignor to Gispen & Staalmeubel B.V., Culemborg, Netherlands
Filed Oct. 2, 1981, Ser. No. 308,032
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

272,206
CHAIR
Martin Kraft, 5644 Charlotte, Kansas City, Mo. 64110
Filed Oct. 16, 1981, Ser. No. 311,995
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

272,207
BED
James R. Hull, 148 S. Westgate Ave., Los Angeles, Calif. 90049
Filed Feb. 17, 1981, Ser. No. 234,600
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—83



272,208

HOLDER FOR TOILET ARTICLES

Heinz G. Baus, Wartbodenstr. 35, CH-3626 Hünibach-Thun, Switzerland

Filed Sep. 10, 1981, Ser. No. 301,042

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1981, URA 281/81

Term of patent 14 years

Int. Cl. D23—*02*

U.S. Cl. D6—86

272,209

WALL-MOUNTED IRRIGATION CABINET FOR DOUCHING AND ENEMAS

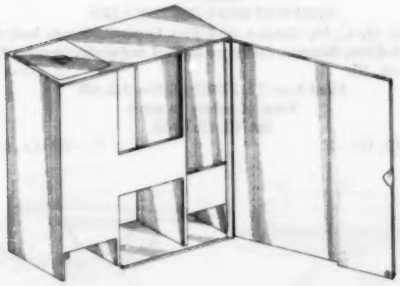
Kenneth Russell, c/o 4412 Angeles Vista Blvd., and John W. Heath, Jr., 4412 Angeles Vista Blvd., both of Los Angeles, Calif. 90043

Filed May 11, 1981, Ser. No. 262,471

Term of patent 14 years

Int. Cl. D23—*02*

U.S. Cl. D6—104



272,210

CHEST OF DRAWERS

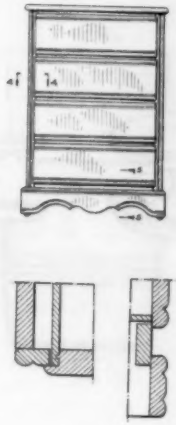
Merlin A. Brunner, New London; Harvey J. Draheim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.

Filed Aug. 7, 1981, Ser. No. 290,994

Term of patent 14 years

Int. Cl. D06—*04*

U.S. Cl. D6—165



272,211

HINGE MOUNTING PLATE

Erich Rock, Hochst, and Klaus Bustle, Lauterach, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst, Austria

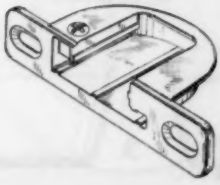
Filed Sep. 4, 1981, Ser. No. 299,525

Claims priority, application Austria, May 3, 1981, 26.318; May 3, 1981, 26.324

Term of patent 14 years

Int. Cl. D6—*99*

U.S. Cl. D6—194

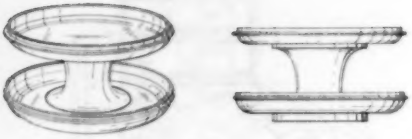


272,212

TIERED SERVING DISH OR THE LIKE

Robert H. C. M. Daenen, and Rita Goyens-Daenen, both of Hekelgem, Belgium, assignors to Dart Industries Inc., Northbrook, Ill.

Filed Nov. 27, 1981, Ser. No. 325,604
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—4



272,213

FOOD STORAGE CUP OR COVER OR THE LIKE

Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Northbrook, Ill.

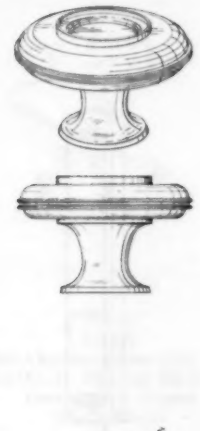
Filed Nov. 27, 1981, Ser. No. 325,246
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—6

272,214

COVERED SERVING DISH OR THE LIKE

Robert H. C. M. Daenen, and Rita Goyens-Daenen, both of Hekelgem, Belgium, assignors to Dart Industries Inc., Northbrook, Ill.

Filed Nov. 27, 1981, Ser. No. 325,619
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—17



272,215

SERVING DISH OR THE LIKE

Robert H. C. M. Daenen, and Rita Goyens-Daenen, both of Hekelgem, Belgium, assignors to Dart Industries Inc., Northbrook, Ill.

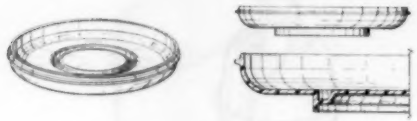
Filed Nov. 27, 1981, Ser. No. 325,408
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—22

272,216

SERVING DISH OR THE LIKE

Robert H. C. M. Daenen, and Rita Goyens-Daenen, both of Hekelgem, Belgium, assignors to Dart Industries Inc., Northbrook, Ill.

Filed Nov. 27, 1981, Ser. No. 325,410
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—23



272,217

SERVING DISH OR THE LIKE

Robert H. C. M. Daenen, and Rita Goyens-Daenen, both of Hekelgem, Belgium, assignors to Dart Industries Inc., Northbrook, Ill.

Filed Nov. 27, 1981, Ser. No. 325,411
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—23

272,218

SERVING DISH OR THE LIKE

Robert H. C. M. Daenen, and Rita Goyens-Daenen, both of Hekelgem, Belgium, assignors to Dart Industries Inc., Northbrook, Ill.

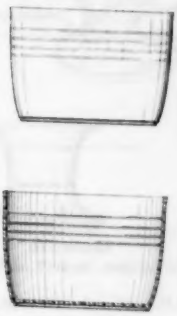
Filed Nov. 27, 1981, Ser. No. 325,605
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—27

272,219

EGG COOKER VESSEL

Kok K. Hor, Jalan Tempinis 3, Lucky Garden, Bangsar, Kuala Lumpur, Malaysia

Filed May 27, 1981, Ser. No. 267,624
Claims priority, application United Kingdom, Feb. 13, 1981, 998908
Term of patent 14 years
Int. Cl. D07—*02, 01*
U.S. Cl. D7—28



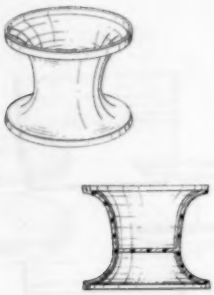
272,220

PLATE OR SIMILAR ARTICLE

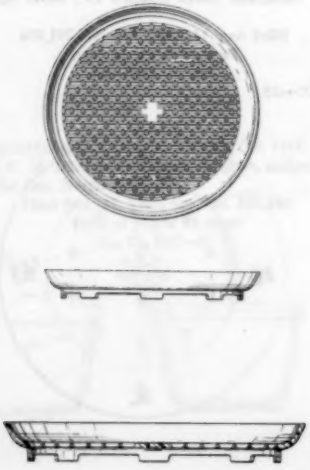
James S. Thompson, 10616 Dunkirk Dr., Silver Spring, Md. 20902

Filed Aug. 11, 1981, Ser. No. 291,974
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—35

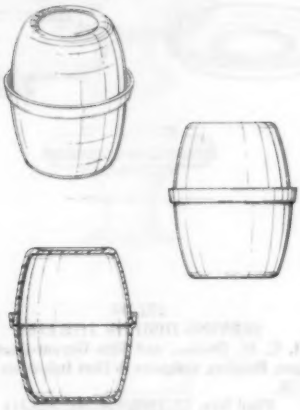
272,221
DISH PEDESTAL OR THE LIKE
Robert H. C. M. Daenen, and Rita Goyens-Daenen, both of Hekelgem, Belgium, assignors to Dart Industries Inc., Northbrook, Ill.
Filed Nov. 27, 1981, Ser. No. 325,409
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—39



272,222
DRAINER TRAY OR THE LIKE
Kazunobu Cho, Tokyo, Japan, assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jun. 18, 1981, Ser. No. 274,858
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—47

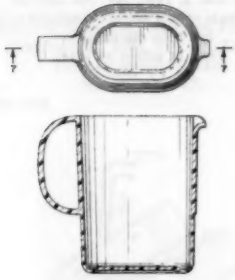


272,223
CLOSURED FOOD STORAGE CUP OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Northbrook, Ill.
Filed Nov. 27, 1981, Ser. No. 325,244
Term of patent 14 years
Int. Cl. D07—*79*
U.S. Cl. D7—79

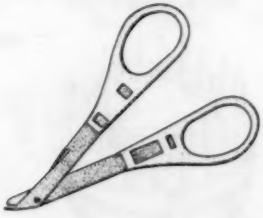


272,224
EGG CUTTER
George G. Reinhard, 11901 E. 13 Mile Rd., Warren, Mich. 48093
Filed Oct. 30, 1981, Ser. No. 316,966
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—106

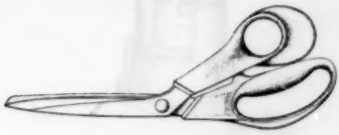
272,225
JUG OR THE LIKE
Pieter K. J. DeCoster, Aalst, Belgium, assignor to Dart Industries Inc.
Filed Dec. 24, 1981, Ser. No. 334,286
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—319



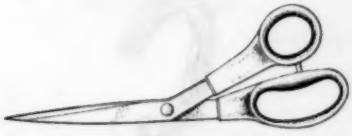
272,226
STAPLE EXTRACTING INSTRUMENT
Lehmann K. Li, Fairfield, Conn.; Jay E. Campbell, Upper Black Eddy, and Richard H. Reichmann, Churchville, both of Pa., assignors to American Cyanamid Company, Stamford, Conn.
Filed Mar. 19, 1981, Ser. No. 245,561
Term of patent 14 years
Int. Cl. D8—*05*; D24—*02*
U.S. Cl. D8—48



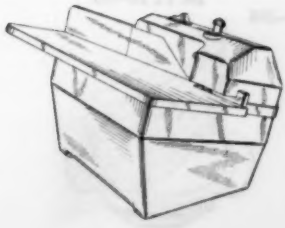
272,227
SCISSORS
Erkki O. Linden, Billnäs, and Olof F. Bäckström, Tammisaari, both of Finland, assignors to Oy Fiskars AB, Helsinki, Finland
Filed Feb. 2, 1981, Ser. No. 230,574
Claims priority, application Finland, Aug. 20, 1980, 591/80
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D8—57



272,228
SCISSORS
Erkki O. Linden, Billnäs, Finland, assignor to Oy Fiskars AB, Helsinki, Finland
Filed Feb. 4, 1981, Ser. No. 231,198
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D8—57



272,229
LETTER OPENER
James J. Oussani, Brooklyn, N.Y., assignor to The Staplex Company, Inc., Brooklyn, N.Y.
Filed Jan. 19, 1982, Ser. No. 340,698
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D8—61

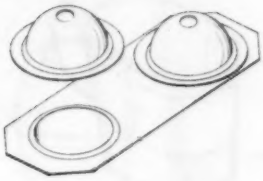


272,230
SCREW STARTER
Robert E. Hanks, 1026 W. Vandeveer, Taylorville, Ill. 62568
Filed Jul. 9, 1981, Ser. No. 281,586
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—82

272,231
CLIP FOR HOLDING A GAS PUMP NOZZLE TRIGGER IN THE OPEN POSITION
Richard F. Black, Jr., 3101 Flameleaf, Garland, Tex. 75042
Filed Aug. 31, 1981, Ser. No. 295,033
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—349

272,232
PACKAGING CONTAINER FOR ICE CREAM OR THE LIKE
Christian Parmentier, 4, Avenue des Bouleaux, 44260 - Savenay Malville, France
Filed Apr. 30, 1981, Ser. No. 260,094
Claims priority, application France, Nov. 3, 1980, 803388
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—345

272,233
MULTI-COMPARTMENTED PACKAGING CONTAINER FOR ICE CREAM OR THE LIKE
Christian Parmentier, 4, Avenue des Bouleaux, 44260 - Savenay Malville, France
Filed Apr. 30, 1981, Ser. No. 260,095
Claims priority, application France, Dec. 18, 1980, 803913
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—345



272,234
CONTAINER HANDLE OR SIMILAR ARTICLE
Thomas H. Hayes, Westport, Conn., assignor to Ethyl Corporation, Richmond, Va.
Filed Jun. 3, 1981, Ser. No. 269,540
The portion of the term of this patent subsequent to Dec. 2, 1994, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—434

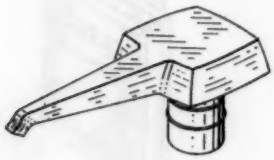
272,235
POWDER APPLICATOR CAP
Joseph Orlando, Mesa, Ariz., assignor to Farnam Companies, Inc., Phoenix, Ariz.
Filed Aug. 20, 1981, Ser. No. 294,449
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—436

272,236

DISPENSING PUMP HEAD

John W. McDonald, Parkville, Mo., assignor to Realex Corporation, Kansas City, Mo.

Filed Jun. 22, 1981, Ser. No. 275,945
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—448

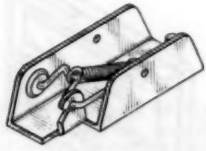


272,237

INTRUDER ALARM FOR DOORS, WINDOWS AND THE LIKE

David Preciado, 121 Lupe Ave., Newbury Park, Calif. 91320

Filed Nov. 12, 1981, Ser. No. 320,412
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

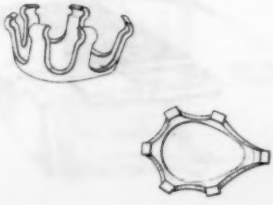


272,238

JEWELRY SETTING

William C. Liebrick, Warwick, and Charles A. Morvillo, East Greenwich, both of R.I., assignors to Lee's Manufacturing Co., Inc., N. Providence, R.I.

Filed Dec. 28, 1981, Ser. No. 335,290
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—92

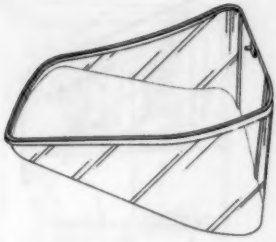


272,239

MODULAR HATCHBACK ENCLOSURE ACCESSORY

Del P. Freeman, Dade County, Fla., assignor to Richard Berkowitz, Miami, Fla., Trustee

Filed Dec. 15, 1980, Ser. No. 216,538
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



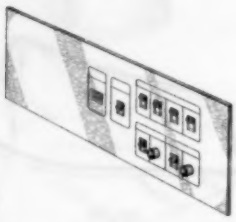
272,240

GRILLE FOR MOUNTING ONTO THE LICENSE PLATE HOLDER IN THE FRONT BUMPER OF AN AUTOMOBILE

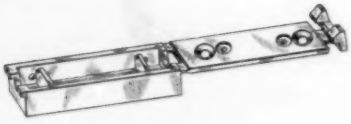
Marlin C. Berg, 6515 Tamerlane, West Bloomfield, Mich. 48033

Filed Sep. 23, 1981, Ser. No. 304,831
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—163

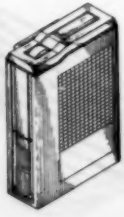
272,241
CONTROL PANEL FOR USE AS A HOUSING FOR ELECTRICAL AND ELECTRONIC CONTROL CIRCUITRY
William V. Dahlgren, Jr., 240 Dolores, Apt. 138, San Francisco, Calif. 94103; Lewis S. Silverstein, 695 Connecticut Ave., #4, San Francisco, Calif. 94107, and Edward W. Claire, 5332 Shafter Ave., Oakland, Calif. 94618
Filed Jul. 9, 1981, Ser. No. 281,608
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



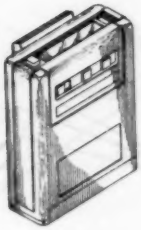
272,242
LATCHING HOUSING FOR MINIATURE ELECTRICAL COMPONENTS
Thomas J. Holce, Portland, and Charles M. Huckins, Tigard, both of Oreg., assignors to Sentrol, Inc., Portland, Oreg.
Filed May 11, 1981, Ser. No. 262,600
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—40



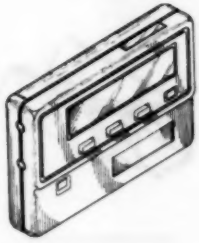
272,243
RADIO PAGER OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 28, 1981, Ser. No. 306,576
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



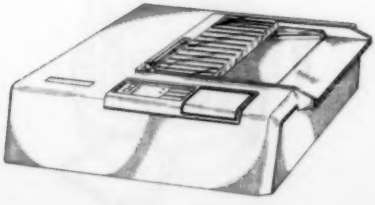
272,244
RADIO PAGER OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 28, 1981, Ser. No. 306,578
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



272,245
RADIO PAGER OR SIMILAR ARTICLE
William J. Scheid; Richard D. Lipinski, both of Coral Springs, and Giovanni Jaramillo, Plantation, all of Fla., assignors to Motorla, Inc., Schaumburg, Ill.
Filed Sep. 28, 1981, Ser. No. 306,579
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



272,246
FACSIMILE TRANSCEIVER OR SIMILAR ARTICLE
Claude H. Hutcheson, Garland, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Sep. 21, 1981, Ser. No. 304,392
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—94



272,247

DESKTOP COMPUTER SYSTEM

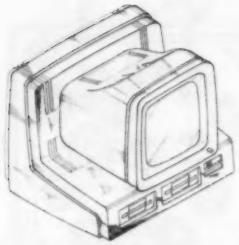
Richard R. Dillon, Wellesley; John E. Graham, Sudbury, and David G. Kmetz, Arlington, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Aug. 31, 1981, Ser. No. 297,689

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—106



272,248

COMPUTER PERIPHERAL OR SIMILAR ARTICLE

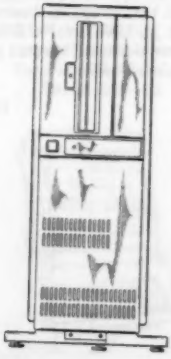
Matthew H. L. Sanders, Cupertino; Scott H. Stillinger, Los Gatos; Michael J. Nuttall, and William G. Moggridge, both of Palo Alto, all of Calif., assignors to Convergent Technologies, Inc., Santa Clara, Calif.

Filed Jan. 9, 1981, Ser. No. 223,789

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—109



272,249

COMPUTER PERIPHERAL OR SIMILAR ARTICLE

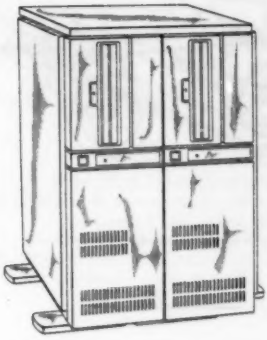
Scott H. Stillinger, Los Gatos; Michael J. Nuttall, and William G. Moggridge, both of Palo Alto, all of Calif., assignors to Convergent Technologies, Inc., Santa Clara, Calif.

Filed Jan. 9, 1981, Ser. No. 223,803

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—109



272,250

QUICK HITCH FOR EARTH HANDLING TOOLS

Torsten Larsson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

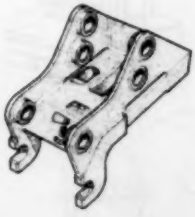
Filed Oct. 26, 1981, Ser. No. 315,119

Claims priority, application Sweden, May 12, 1981, 81-1137

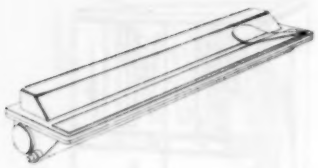
Term of patent 14 years

Int. Cl. D15—*03*

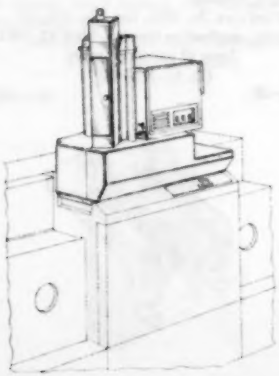
U.S. Cl. D15—28



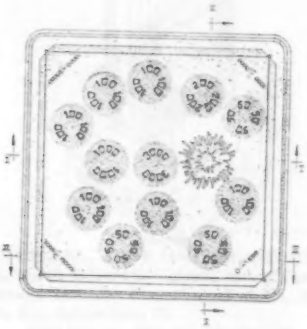
272,251
DEVELOPER CONTAINER
Manzo Yoshihama, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Jul. 31, 1981, Ser. No. 288,676
Claims priority, application Japan, Feb. 2, 1981, 56-003619
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D16—32



272,252
PRINTING ATTACHMENT FOR A PHOTOGRAPHIC PRINTER OR SIMILAR ARTICLE
Ralph M. Vigna, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 13, 1981, Ser. No. 321,343
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—37



272,253
GAME BOARD
Louis A. Du Plessis, 10 Blamey St., Wagga Wagga, New South Wales, 2650, Australia
Filed Oct. 27, 1981, Ser. No. 315,284
Claims priority, application Australia, Apr. 29, 1981, 84020
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—17



272,254
POKER MACHINE CABINET
Joseph R. Heywood, Chorleywood, England, assignor to Ainsworth Nominees Pty. Ltd., Rosebery, Australia
Filed Mar. 17, 1982, Ser. No. 358,927
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—38

272,255
TOY BLOCK

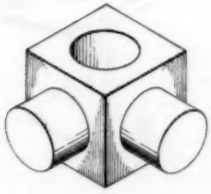
Yasushi Chatani, Tokorozawa, and Toshio Tsuchikura, Koshigaya, both of Japan, assignors to Kawada Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1979, Ser. No. 64,486
Claims priority, application Japan, May 8, 1978, 53-18408
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—108

272,256
TOY BLOCK

Yasushi Chatani, Tokorozawa, and Toshio Tsuchikura, Koshigaya, both of Japan, assignors to Kawada Co., Ltd., Tokyo, Japan

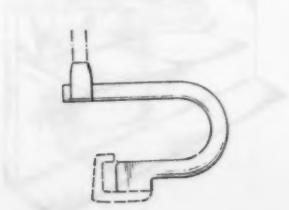
Filed Aug. 7, 1979, Ser. No. 64,487
Claims priority, application Japan, May 8, 1978, 53-18406
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—108



272,257
COMBINED GOLF PUTTER HOSEL AND ALIGNMENT INDICATOR

Sonnie J. Perkins, 1214-169th Ave. NE., Bellevue, Wash. 98008

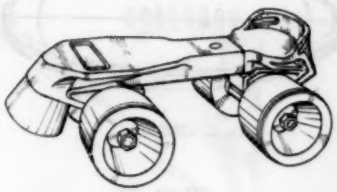
Filed Feb. 17, 1981, Ser. No. 235,434
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—221



272,258
ROLLER SKATE

Icaro Olivieri, Montebelluna, Italy, assignor to Icaro Olivieri & C. S.p.A., Montebelluna, Italy

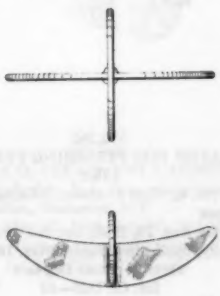
Filed Jul. 15, 1981, Ser. No. 283,329
Claims priority, application Italy, Feb. 23, 1981, 20867 B/81
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226



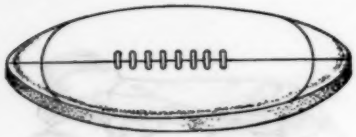
272,259
DIVER'S TOWABLE DIVING PLANE

Robert L. Meister, 4404 Old Mill Rd., Fort Wayne, Ind. 46807

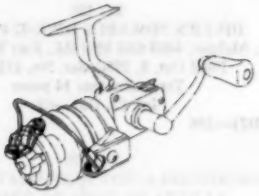
Filed Oct. 6, 1980, Ser. No. 193,937
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—236



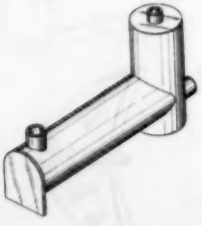
272,260
SWING SEAT
Donald F. Budde, St. Louis County, Mo., assignor to Urethane Roller Specialists, Inc., Eureka, Mo.
Filed Jul. 27, 1981, Ser. No. 287,510
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—246



272,261
FISHING REEL BAIL ARM
Kanji Iinuma, and Kyoichi Kaneko, both of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Nov. 13, 1981, Ser. No. 321,014
Claims priority, application Japan, May 29, 1981, 56-23668
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

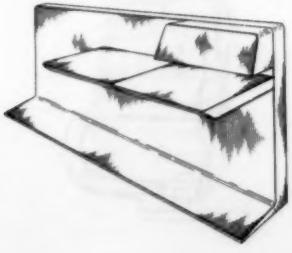


272,262
AIR ELIMINATOR FOR PLUMBING SYSTEMS OR THE LIKE
Keizo Honma, No. 6, Nishi 15-chome, Minami 15 Jo, Chuo-ku, Sapporo, Japan
Filed Aug. 25, 1980, Ser. No. 181,191
Claims priority, application Japan, Mar. 18, 1980, 55-10579
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—46

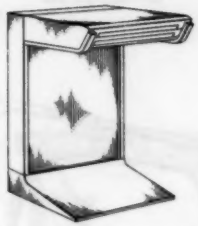


272,263
HAND WASHER
Rolf Lienhard, Wetzikon, Switzerland, assignor to Maschinenfabrik Ad. Schulthess & Co., AG, Zurich, Switzerland
Filed Dec. 2, 1981, Ser. No. 326,572
Claims priority, application Switzerland, Jun. 2, 1981, 111.802
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—59

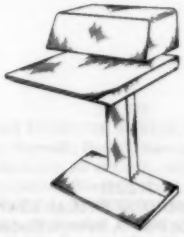
272,264
DENTAL TREATMENT CABINET
Carl W. Voltz, Lindenfels, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.
Filed May 13, 1981, Ser. No. 263,226
Term of patent 14 years
Int. Cl. D24—*01*; D6—*03*
U.S. Cl. D24—1.1



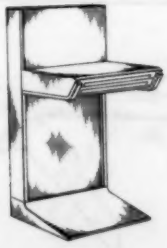
272,265
DENTAL TREATMENT CABINET
Carl W. Voltz, Lindenfels, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.
Filed May 13, 1981, Ser. No. 263,229
Term of patent 14 years
Int. Cl. D24—*01;* D6—*03*
U.S. Cl. D24—1.1



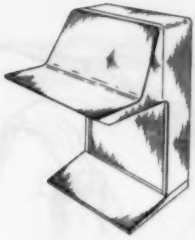
272,266
DENTAL TREATMENT CABINET
Carl W. Voltz, Lindenfels, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.
Filed May 13, 1981, Ser. No. 263,232
Term of patent 14 years
Int. Cl. D24—*01;* D6—*03*
U.S. Cl. D24—1.1



272,267
DENTAL TREATMENT CABINET
Carl W. Voltz, Lindenfels, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.
Filed May 13, 1981, Ser. No. 263,233
Term of patent 14 years
Int. Cl. D24—*01;* D6—*03*
U.S. Cl. D24—1.1

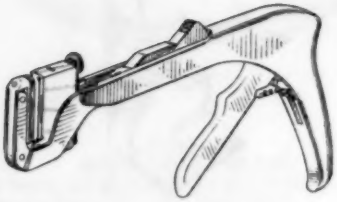


272,268
DENTAL TREATMENT CABINET
Carl W. Voltz, Lindenfels, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.
Filed May 13, 1981, Ser. No. 263,234
Term of patent 14 years
Int. Cl. D6—*179;* D24—*01;* D6—*03*
U.S. Cl. D24—1.1

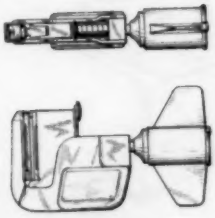


272,269
DENTAL TREATMENT CABINET
Carl W. Voltz, Lindenfels, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.
Filed May 13, 1981, Ser. No. 263,247
Term of patent 14 years
Int. Cl. D24—*01;* D6—*03*
U.S. Cl. D24—1.1

272,270
LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jun. 3, 1981, Ser. No. 270,187
Claims priority, application Canada, May 13, 1981, 12-05-81-3
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

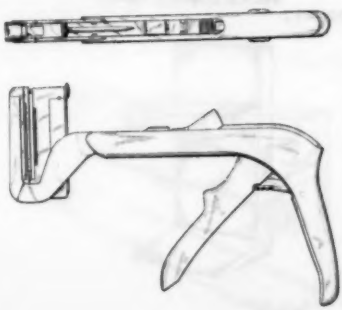


272,271
LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jun. 3, 1981, Ser. No. 270,188
Claims priority, application Australia, Dec. 19, 1980, 82,891; Dec. 19, 1980, 82,892; Canada, May 12, 1981, 12-05-81-2
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

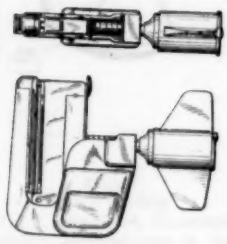


272,272
LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jul. 2, 1981, Ser. No. 280,111
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

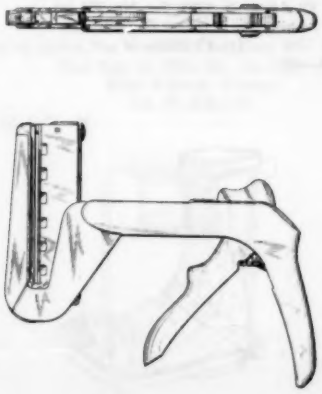
272,273
LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jun. 3, 1981, Ser. No. 270,273
Claims priority, application Australia, Dec. 19, 1980, 82,887; Dec. 19, 1980, 82,888; Canada, May 12, 1981, 12-05-81-3
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26



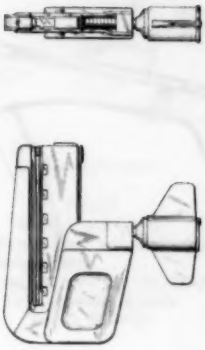
272,274
LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jun. 3, 1981, Ser. No. 270,275
Claims priority, application Australia, Dec. 19, 1980, 82,893; Dec. 19, 1980, 82,894; Canada, May 12, 1981, 12-05-81-2
Term of patent 14 years
Int. Cl. D24—02
U.S. Cl. D24—26



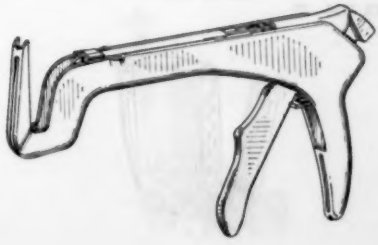
272,275
LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jun. 3, 1981, Ser. No. 270,279
Claims priority, application Australia, Dec. 19, 1980, 82,889; Dec. 19, 1980, 82,890; Canada, May 12, 1981, 12-05-81-3
Term of patent 14 years
Int. Cl. D24—02
U.S. Cl. D24—26



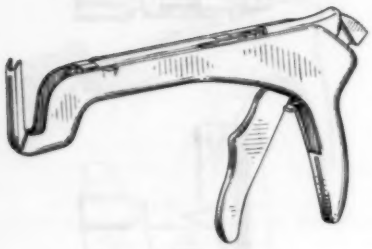
272,276
LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jun. 3, 1981, Ser. No. 270,281
Claims priority, application Australia, Dec. 19, 1980, 82,895; Dec. 19, 1980, 82,896; Canada, May 12, 1981, 12-05-81-2
Term of patent 14 years
Int. Cl. D24—02
U.S. Cl. D24—26



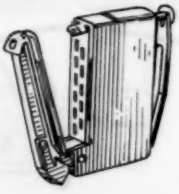
272,277
LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jul. 2, 1981, Ser. No. 279,683
Term of patent 14 years
Int. Cl. 24—02
U.S. Cl. D24—26



272,278
LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jul. 2, 1981, Ser. No. 279,684
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

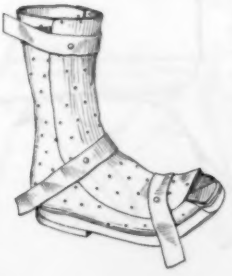


272,279
DISPOSABLE STAPLE CARTRIDGE FOR LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Jul. 2, 1981, Ser. No. 280,106
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—27

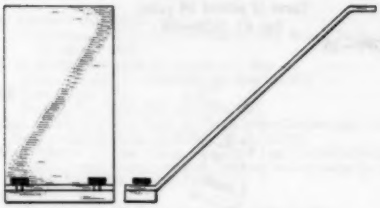


272,280
CONTEMPLATION CHAMBER
Kurt J. McKay, 895 Northeast 98th St., Miami Shores, Fla. 33138
Filed Jul. 6, 1981, Ser. No. 281,001
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02*
U.S. Cl. D24—38

272,281
CONTRACTURE CONTROL ORTHOSIS
Joseph Alush, Des Plaines, Ill., assignor to Baliert Orthopedic Corp., Northbrook, Ill.
Filed Sep. 28, 1981, Ser. No. 306,166
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



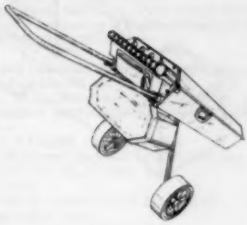
272,282
DEFLECTOR FOR SWIMMING POOL SKIMMER
Daniel T. Roth, 17018 Aspen Way, Morgan Hill, Calif. 95037
Filed Aug. 6, 1981, Ser. No. 291,370
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—02



272,283
BLOW DRYER
Frank Antonacci, 276 Indian Trial, Moutainside, N.J. 07092, and Ronald Carluccio, 242 Washington St., Berkeley Heights, N.J. 07922
Filed Oct. 5, 1981, Ser. No. 308,835
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

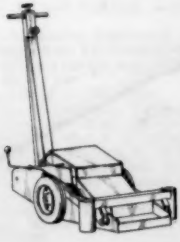
272,284
LIVESTOCK DUST BAG STAND
Darrel O. Leffel, Rte. 1, Box 50, Stratford, Wis. 54484
Filed Sep. 11, 1981, Ser. No. 301,147
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—45

272,285
MOBILE GOLF CLUB CONTAINER
Peter J. Gillett, 23, Lanfrey Pl., West Kensington, London, W14 9PY, England
Filed Oct. 2, 1981, Ser. No. 307,890
Claims priority, application United Kingdom, Apr. 10, 1981, 999926
Term of patent 14 years
Int. Cl. D12—*02*; D3—*01*
U.S. Cl. D34—15

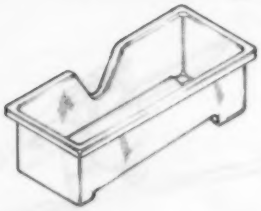


272,286
BARBECUE CART
Joseph W. Sroub, Parma, Ohio, assignor to Cardinal American Corporation, Cleveland, Ohio
Filed Aug. 21, 1981, Ser. No. 295,223
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—21

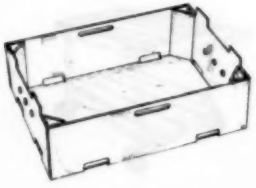
272,287
LIFTING JACK
Tamotsu Kameda, Shizuoka, Japan, assignor to Yasui Sangyo Co., Ltd., Shizuoka, Japan
Filed Jun. 3, 1981, Ser. No. 270,138
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—31



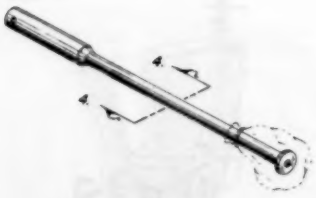
272,288
MATERIAL HANDLING TRANSPORT TRAY OR THE LIKE
Wayne K. Pfaff, 1316 Savannah, Irving, Tex. 75062
Filed Jul. 31, 1981, Ser. No. 289,044
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D34—40



272,289
FRUIT BOX
Jose Segura Palenzuela, Miramar, 18 - 35a, Gandia (Valencia), Spain
Filed Mar. 3, 1981, Ser. No. 240,064
Claims priority, application Spain, Dec. 29, 1980, 98-485
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D34—40



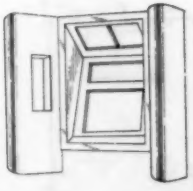
272,290
FIXTURE CLEANER
Kevin J. Wilson, 5140 Marita La., #D, Anaheim, Calif. 92807
Filed Mar. 24, 1981, Ser. No. 246,996
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—51



272,291
AUTOMATED TELLER MACHINE MODULE
Charles Hauser, and Sharon Johnson, both of Atlanta, Ga., assignors to The Central Trust Company, N.A., Cincinnati, Ohio
Continuation-in-part of Ser. No. 140,238, Apr. 14, 1980, Pat. No. Des. 264,264. This application Jan. 5, 1981, Ser. No. 222,610
The portion of the term of this patent subsequent to May 4, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D31—*99*
U.S. Cl. D99—28

272,292
COMBINATION LOCK VAULT
Ralph L. Campbell, 3790 Park South Ct.-302, Topeka, Kans. 66609
Filed Jun. 28, 1981, Ser. No. 305,978
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D99—28

272,293
AUTOMATIC TELLER MACHINE BOOTH
John E. Barthel, Dallas, Tex., assignor to Dahl-Braden, Chapman Architects, Inc., Dallas, Tex.
Filed Jul. 13, 1981, Ser. No. 283,030
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—43



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JANUARY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Antikainen, Jukka; Evalahti, Osmo; and Waris, Tapio, 4,426,257, Cl. 162-336.000.

A. O. Smith Harvestore Products, Inc.: *See*—
Olson, George E., 4,426,187, Cl. 414-310.000.

AB Erik Bohlin: *See*—
Wedlin, Per, 4,425,986, Cl. 184-3.200.

Abel, Heinz; and Oxe, Josef, to Ciba-Geigy Corporation. Stable anhydrous textile assistant. 4,426,203, Cl. 8-138.000.

Abel, Michael L.; and Yates, Thomas P., to Northern Petrochemical Company. Antifreeze corrosion inhibitor composition for aluminum engines. 4,426,309, Cl. 252-75.000.

ABIC Ltd.: *See*—
Simonovitch, Chaim, 4,426,522, Cl. 544-182.000.

Abiru, Akira; Sugimoto, Masahiro; and Inomata, Juro, to Fujitsu Limited. Semiconductor device and method for producing same. 4,426,657, Cl. 357-29.000.

Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., to United States of America, Army. Three and four product surface-wave acousto-optic time integrating correlators. 4,426,134, Cl. 350-358.000.

Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG: *See*—
37Mund, Ingo, 4,425,959, Cl. 164-342.000.

Acra-Plant, Inc.: *See*—
Williams, Donald E.; and Robertson, Forrest E., 4,425,973, Cl. 172-574.000.

Adam, Jean-Marie; and Buhler, Arthur, to Ciba-Geigy Corporation. Reactive dyes, their preparation and use. 4,426,328, Cl. 260-162.000.

Adamo, Rosario; and Patch, Arthur H., to Pennwalt Corporation. Polyelectrolyte wetting apparatus. 4,426,156, Cl. 366-156.000.

Adams, George E., III; Bailey, Edwin C.; Klimowicz, Richard F.; and Cope, Geoffrey W., to Dresser Industries, Inc. Railway car coupler. 4,426,012, Cl. 213-135.000.

Adin, Anthony; and DeSelms, Roy C., to Eastman Kodak Company. Dye-forming developers in an imaging material and process. 4,426,441, Cl. 430-351.000.

Advanced Systems Incorporated: *See*—
Hull, J. Richard, 4,425,869, Cl. 118-314.000.

Advanced Technology Inc.: *See*—
Intrater, Josef; and Bertoldo, Gene, 4,426,423, Cl. 428-408.000.

Aero Power Engine Manufacturing, Inc.: *See*—
Lyndhurst, Francis R., 4,425,881, Cl. 123-52.0MV.

Agency of Industrial Science and Technology: *See*—
Shinozaki, Kichitaro; Sato, Kiyoshi; and Shimizu, Toru, 4,425,774, Cl. 72-257.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Helling, Gunter, 4,426,438, Cl. 430-213.000.

Aggarwal, Sundar L.: *See*—
Vitus, Francis J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,426,495, Cl. 525-92.000.

Agrigenetics Research Associates Limited: *See*—
Henke, Randolph R., 4,425,737, Cl. 47-58.000.

Aguro, Yoshinori; and Torigai, Akiyoshi, to Canon Kabushiki Kaisha. Cleaning device for cleaning an image bearing member with developer. 4,426,151, Cl. 355-15.000.

Aho, Robert T.: *See*—
Ida, Noble; Nelson, Paul E.; Haugen, Peter N.; Aho, Robert T.; and Lucas, Andrew A., 4,426,251, Cl. 156-656.000.

Aigner, Ernst: *See*—
Louis, Eckhart; Aigner, Ernst; and Hechtl, Wolfgang, 4,426,240, Cl. 156-99.000.

Ainsworth, Leonard H.: *See*—
Heywood, Joseph R.; and Ainsworth, Leonard H., 4,426,082, Cl. 273-143.00R.

Aisin Seiki Company, Limited: *See*—
Furuta, Yoichi, 4,425,760, Cl. 60-547.100.

Aisin Seiki Kabushiki Kaisha: *See*—
Mori, Keiji, 4,426,112, Cl. 296-223.000.

Ajima, Takashi: *See*—
Ohshima, Jiro; Koshino, Yutaka; Ajima, Takashi; and Yonezawa, Toshio, 4,426,234, Cl. 148-1.500.

Akagi, Toshimichi: *See*—
Tadokoro, Tomoo; Hayama, Nobuhiro; and Akagi, Toshimichi, 4,425,883, Cl. 123-242.000.

Akashi, Shunji; and Matsuda, Yoshio, to Yoshida Kogyo K. K. Separable slide fastener. 4,425,684, Cl. 24-434.000.

Akashi, Tetsuji: *See*—
Kato, Masaaki; and Akashi, Tetsuji, 4,425,894, Cl. 123-446.000.

Akzo NV: *See*—
Brandner, Alexander; and Zengel, Hand G., 4,426,228, Cl. 106-203.000.

Albert Frankenthal AG: *See*—
Fischer, Emil, 4,426,074, Cl. 271-302.000.

Albrecht, Klaus; and Haub, Martin, to VDO Adolf Schindling AG. Device for the electric monitoring of the level of a liquid contained in a container. 4,425,795, Cl. 73-295.000.

Alcolac Inc.: *See*—
Sandri, Joseph M.; Calentine, John W.; Linder, Seymour M.; and Billoux, Yves J., 4,426,503, Cl. 526-263.000.

Alexander, Jose; and Shih, Chung, to Merck & Co., Inc. [(Alkoxycarbonyl)oxy]alkyl esters of methyldopa. 4,426,391, Cl. 424-301.000.

Alfa-Laval AB: *See*—
Fecske, Aurel J., 4,426,283, Cl. 209-211.000.

Allen, Lyal D., to Horwood Bagshaw Limited. Folding agricultural implement. 4,425,971, Cl. 172-311.000.

Allied Corporation: *See*—
Vander Mey, John E., 4,426,311, Cl. 252-143.000.

Allis-Chalmers Corporation: *See*—
West, Floyd G., 4,425,821, Cl. 74-604.000.

Alluminio Italia S.p.A.: *See*—
Di Russo, Ettore; Buratti, Massimo; and Veronelli, Silvano, 4,426,429, Cl. 428-654.000.

Alonzo, Julius L. Bowling alley pitboard. 4,426,078, Cl. 273-43.00R.

Alps Electric Co., Ltd.: *See*—
Iwane, Yasuhiko, 4,426,167, Cl. 400-159.000.
Kondo, Shiro; and Mizuta, Ken, 4,426,559, Cl. 200-67.0DB.
Okuya, Tsutae; and Ito, Yoshiyuki, 4,426,634, Cl. 338-161.000.
Takezawa, Keiji, 4,426,635, Cl. 338-183.000.
Yoshisato, Akiyuki; and Igarashi, Sadao, 4,426,627, Cl. 331-12.000.

Alston, William W., Jr.; Bloom, William G.; and Johnson, William C., to Raychem Corporation. Torque transmitting catheter apparatus. 4,425,919, Cl. 128-658.000.

Amco Corporation: *See*—
Olson, Ralph B.; and Musick, Stuart I., 4,426,008, Cl. 211-49.00D.

American Coal Enterprises, Inc.: *See*—
Porta, Livio D.; Berkowitz, David A.; Withuhn, William L.; and Hamilton, Carl C., 4,425,763, Cl. 60-693.000.

American Cyanamid Company: *See*—
Bann, Robert F.; and Innes, John E., 4,426,205, Cl. 8-523.000.

American Electronic Laboratories, Inc.: *See*—
Korsen, Iverson, 4,426,650, Cl. 343-903.000.

American Optical Corporation: *See*—
Grendol, Clark L.; and Seager, Richard H., 4,425,669, Cl. 2-436.000.

American Standard, Inc.: *See*—
Sarkans, Ivars; and Figgins, Charles A., 4,426,242, Cl. 156-252.000.

Amersham International Limited: *See*—
Cree, Gavin M.; Wilkins, Terence A.; Monks, Reginald; and Nowotnik, David P., 4,426,453, Cl. 436-500.000.
Tovey, Keith C.; and Carrick, David T., 4,426,455, Cl. 436-505.000.

AMF Incorporated: *See*—
Hargett, Francis B., 4,425,858, Cl. 112-121.120.

Ammon, Helmut K.; and Updike, John G., to FR. Kaiser GmbH. Fly paper. 4,425,733, Cl. 43-115.000.

AMP Incorporated: *See*—
Crawford, Christopher L., 4,426,125, Cl. 339-99.00R.
Ritchie, Leon T.; Snyder, Clair W., Jr.; and Woratyla, John A., 4,426,123, Cl. 339-75.0MP.

Amplas, Inc.: *See*—
Stock, David K.; and Wech, Robert J., 4,425,988, Cl. 192-18.00R.

Anchor, Michael J.: *See*—
Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Eisenstein, Stephen E., 4,426,300, Cl. 252-8.900.
Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Eisenstein, Stephen E., 4,426,301, Cl. 252-8.900.

Anderson, Lenart: *See*—
Hogan, Lawrence R.; and Anderson, Lenart, 4,426,024, Cl. 222-173.000.

Andreev, Borislav; and Schumacher, Johannes A., to Kracht Pumpen- und Motorenfabrik GmbH & Co. KG. Monitoring system for hydraulic pipelines and/or actuating devices. 4,425,789, Cl. 73-40.50R.

Android Corporation: *See*—
Rise, William E., 4,425,703, Cl. 29-724.000.

Annus, Imre, to Autoipari Kutato Intezet. Turbocharged diesel engine with throttled regulation. 4,425,761, Cl. 60-611.000.

Anthony, James R.; and Lortz, Allan R., to Indiana Mills & Manufacturing, Inc. Child belt buckle. 4,425,688, Cl. 24-656.000.

Antikainen, Jukka; Evalahti, Osmo; and Waris, Tapio, to A. Ahlstrom Osakeyhtio. Damping system for a paper machine headbox. 4,426,257, Cl. 162-336.000.

Anton Steinecker Maschinenfabrik GmbH: *See*—
Drawert, Friedrich; Schreier, Peter; and Kramer, Gabriele, 4,426,210, Cl. 55-73.000.

Antonini, Joseph, to Dana Corporation. Non-metallic guard for sealing lips. 4,426,094, Cl. 277-153.000.

Antos, George J.; and Chao, Tai-Hsiang, to UOP Inc. Reforming hydrocarbons with a platinum group- and phosphorus-containing catalyst. 4,426,279, Cl. 208-138.000.

Aoki, Masayoshi: *See*—
Tsuzuku, Susumu; Kaneda, Aizo; Saeki, Junichi; and Aoki, Masayoshi, 4,426,341, Cl. 264-40.100.

Aoki, Tadao; Miyakoshi, Hideo; and Mizukoshi, Mikio, to Fujirebio Kabushiki Kaisha. Diagnostic method for immune disorders. 4,426,454, Cl. 436-504.000.

Aoki, Takaaki: *See*—
Hashimoto, Seiichi; and Aoki, Takaaki, 4,425,682, Cl. 24-20.00S.

Aoki, Takeo: *See*—
Shimse, Kaoru; Aoki, Takeo; and Taga, Masayuki, 4,426,224, Cl. 75-49.000.

Apple, William C.; and Jacob, Keith D., to Multi-Elmac Company. Combination encoder-decoder integrated circuit device. 4,426,637, Cl. 340-825.650.

Applied Magnetics Corporation: *See*—
Martin, Richard T., 4,425,871, Cl. 118-664.000.

Arai, Naoto; Tuji, Takuji; and Yoneda, Hiroshi, to Kanzaki Paper Mfg. Co., Ltd. Heat-sensitive recording materials. 4,426,424, Cl. 428-411.000.

Arcair Company: *See*—
Coughlin, William J.; Rieppel, Perry J.; and Hoffman, Stephen A., 4,426,566, Cl. 219-137.410.

Archibald, John L.; and Ward, Terrence J., to John Wyeth & Brother Ltd. Piperid-4-yl ureas and thio ureas used as anti-depressant agents. 4,426,387, Cl. 424-267.000.

Arishima, Koichi; Okada, Takeshi; Tate, Akiyuki; and Hiratsuka, Hiroaki, to Nippon Telegraph & Telephone Public Corp. Electrophotographic photoreceptor and preparation thereof. 4,426,434, Cl. 430-128.000.

Arlt, Dieter: *See*—
Jautelat, Manfred; and Arlt, Dieter, 4,426,529, Cl. 548-216.000.

Armond, Joseph A., to Electro-Matic Products Co. Demagnetizer. 4,426,672, Cl. 361-145.000.

Armstrong, Hugh D.: *See*—
Mitchell, Johnny D.; and Armstrong, Hugh D., 4,426,110, Cl. 294-88.000.

Arndt, Friedrich: *See*—
Boroschewski, Gerhard; Nusslein, Ludwig; and Arndt, Friedrich, 4,426,222, Cl. 71-111.000.

Arthur, Gerald F.: *See*—
Wheeler, Eric; and Arthur, Gerald F., 4,426,185, Cl. 414-196.000.

Arthur, John R.: *See*—
Miller, Mark C.; and Arthur, John R., 4,426,569, Cl. 219-272.000.

Arvidsson, Folke L.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Lindberg, Per. L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Nils U. E.; and Wikstrom, Hakan V., to Astra Lakemedel Aktiebolag. Substituted phenyl piperidines. 4,426,386, Cl. 424-267.000.

Asada, Haruhiko; and Kanade, Takeo, to Carnegie-Mellon University. Robotic manipulator. 4,425,818, Cl. 74-469.000.

Asada, Masahiro; Matsuura, Miyuki; and Yonezawa, Kazuya, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Heat-resisting aromatic polyester resin and process for preparing the same. 4,426,511, Cl. 528-128.000.

Asada, Yoshimitsu: *See*—
Ichikawa, Toshiji; Watanabe, Teruko; and Asada, Yoshimitsu, 4,426,290, Cl. 210-516.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Kuriki, Tomio; and Manabe, Seiichi, 4,426,516, Cl. 528-272.000.
Nakamae, Kenji; and Shima, Tsukasa, 4,426,421, Cl. 428-234.000.
Yoshida, Mitsuo; Masuda, Yoshinori; and Kashiwada, Akio, 4,426,271, Cl. 204-296.000.

Ashida, Akira, to Hitachi, Ltd. Clock signal derivation system. 4,426,714, Cl. 375-110.000.

Ast, Gunther E.: *See*—
Cherchian Ara A.; Elert, Karl; and Ast, Gunther E., 4,426,013, Cl. 220-66.000.

Astra Lakemedel Aktiebolag: *See*—
Arvidsson, Folke L.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Lindberg, Per. L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Nils U. E.; and Wikstrom, Hakan V., 4,426,386, Cl. 424-267.000.

Ataka, Yasukazu; Ikezaki, Katuzi; and Umeda, Katsuhiko, to Sharp Kabushiki Kaisha. Vacuum cleaner with dust disposal. 4,426,211, Cl. 55-296.000.

Atkins, Ronald L.; Norris, William P.; Nielsen, Arnold T.; Hollins, Richard A.; and Wilson, William S., to United States of America, Navy. Synthesis of the isomeric aminotetranitrotoluenes. 4,426,539, Cl. 564-441.000.

Atkinson, Renwick S., to Carlton Company. Anti-kickback saw chain. 4,425,830, Cl. 83-833.000.

Atom Sciences, Inc.: *See*—
Hurst, G. Samuel; Payne, Marvin G.; Chen, Chung-Hsuan; and Parks, James E., 4,426,576, Cl. 250-283.000.

Aunsholt, Knud E. H., to Kryolitselskabet Oresund A/S. Process for the separation of coal particles from fly ash by flotation. 4,426,282, Cl. 209-167.000.

Austruy, Georges: *See*—
Thouault, Alain; Chapuis, Claude; and Austruy, Georges, 4,425,902, Cl. 126-360.00R.

Autoipari Kutato Intezet: *See*—
Annus, Imre, 4,425,761, Cl. 60-611.000.

Autotrol Corporation: *See*—
Seal, J. David, 4,426,294, Cl. 210-662.000.

Avco Corporation: *See*—
Kissell, Robert R., 4,426,683, Cl. 364-508.000.

Avery, George S., to V&L Manufacturing Company, Inc. Tufted carpeting, especially artificial turf, with tufts stitched through multiple layers of pre-woven backing material of differing gauge. 4,426,415, Cl. 428-17.000.

B. A. Ballou & Co., Incorporated: *See*—
Sauer, Alfred E., 4,425,687, Cl. 24-664.000.

B. F. Goodrich Company, The: *See*—
Minchak, Robert J., 4,426,502, Cl. 526-172.000.

B & H Manufacturing Company, Inc.: *See*—
Hoffmann, Wolfgang, 4,425,866, Cl. 118-58.000.

B-W Health Products, Inc.: *See*—
Werner, Lester W., 4,425,673, Cl. 5-64.000.
Werner, Lester W., 4,425,674, Cl. 5-68.000.

Babbs, Charles F.: *See*—
Bourland, Joe D.; Geddes, Leslie A.; Babbs, Charles F.; and Tacker, Willis A., Jr., 4,425,920, Cl. 128-672.000.

Babcock & Wilcox Company, The: *See*—
Bybee, Richard T.; Paulson, Arnold E.; and Warren, Holland D., 4,426,352, Cl. 376-255.000.

Bachus, Benson F.; and Dornberger, Georg C. E., to Western Electric Company, Inc. Wire insulating method and apparatus. 4,426,255, Cl. 162-106.000.

Backer, Stanley; and Zimmerman, Michael A. Fabric forming process. 4,425,691, Cl. 28-166.000.

Bacot, Pierre C. A.; and Isert, Michel, to CII Honeywell Bull. Process and device for managing the conflicts raised by multiple access to same cache memory of a digital data processing system having plural processors, each having a cache memory. 4,426,681, Cl. 364-200.000.

Baer, Ulrich; Distler, Walter; and Grassmann, Peter, to Siemens Aktiengesellschaft. Radiation diagnostic apparatus. 4,426,715, Cl. 378-4.000.

Bahadir, Mufit; Payer, Wolfgang; Forster, Ingrid; and Lummen, Hans-Albert, to Ruhrchemie Aktiengesellschaft. Process for the preparation of supported catalysts for the polymerization of olefins. 4,426,315, Cl. 502-113.000.

Bailey, Bob: *See*—
Fraser, James Y.; and Bailey, Bob, 4,425,690, Cl. 24-351.000.

Bailey, Edwin C.: *See*—
Adams, George E., III; Bailey, Edwin C.; Klimowicz, Richard F.; and Cope, Geoffrey W., 4,426,012, Cl. 213-135.000.

Bailey, Joseph; Clarke, David; and Johnston, Linda G., to Eastman Kodak Company. Nondiffusible metal-complexed azo dye-releasing compounds. 4,426,326, Cl. 260-146.00R.

Ballard, John R.; Bennett, George H.; and Lee, Leslie A., to Rolls-Royce Limited. Gas turbine engine and its associated air intake system. 4,425,756, Cl. 60-39.092.

Bandura, Vitaly: *See*—
Maxner, Richard B.; and Bandura, Vitaly, 4,425,947, Cl. 140-105.000.

Banks, Eddie D.; Simmons, Gerald C.; and Roberts, Roger F., to Boeing Commercial Airplane Company. Aircraft container delivery system having a positive release gate. 4,426,051, Cl. 244-137.00R.

Bann, Robert F.; and Innes, John E., to American Cyanamid Company. Novel red dyes for fiberglass and paper. 4,426,205, Cl. 8-523.000.

Barbee, Robert B.; and Wicker, Thomas H., Jr., to Eastman Kodak Company. Polyester containers having improved gas barrier properties. 4,426,512, Cl. 528-173.000.

Barbier, William J., to Sporlan Valve Company. Refrigeration control system for modulating electrically-operated expansion valves. 4,425,767, Cl. 62-212.000.

Barcza, Nicholas A.: *See*—
Curr, Thomas R.; and Barcza, Nicholas A., 4,426,223, Cl. 75-10.00R.

Barker, George E.; and Forster, Denis, to Monsanto Company. Synthesis of plasticizer and detergent alcohols. 4,426,542, Cl. 568-883.000.

Baron, Arthur L.: *See*—
Krishnan, Sivaram; and Baron, Arthur L., 4,426,514, Cl. 528-204.000.

Bartur, Joseph. Inground fluid storage tank and method of erection thereof. 4,425,743, Cl. 52-169.500.

BASF Aktiengesellschaft: *See*—
Hamprecht, Berhard; and Wuerzer, Bruno, 4,426,219, Cl. 71-91.000.
Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, 4,426,220, Cl. 71-98.000.
Thoemel, Frank; and Hoffmann, Werner, 4,426,332, Cl. 260-465.00F.

BASF Wyandotte Corporation: *See*—
Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Eisenstein, Stephen E., 4,426,300, Cl. 252-8.900.
Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Eisenstein, Stephen E., 4,426,301, Cl. 252-8.900.
Sharangpani, Shrikishna G.; and Spence, Floyd G., 4,426,291, Cl. 210-634.000.

Basseches, Harold; and Oswald, Donald R. Napkin clip. 4,425,680, Cl. 24-7.000.

Bastenhof, Dirk; Brisson, Roger; and Bonniot, Claude, to Societe d'Etudes de Thermiques S.E.M.T. Fuel-injection pump for internal combustion engine. 4,426,198, Cl. 417-494.000.

Bateman, Jess R.: *See*—
Beach, Russell J.; Bateman, Jess R.; and Carpenter, Robert L., 4,425,771, Cl. 70-276.000.

Battelle Development Corporation: *See*—
Nandi, Uma S., 4,426,504, Cl. 526-282.000.

Bauer, Peter. Flat-packaged air glider toy. 4,425,734, Cl. 46-74.00D.

Baumann, Marcus: *See*—
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, 4,426,380, Cl. 424-244.000.

Baumoel, Joseph. Transducer structure and mounting arrangement for transducer structure for clamp-on ultrasonic flowmeters. 4,425,803, Cl. 73-861.180.

Bausch & Lomb Incorporated: *See*—
Stephens, Donn E., 4,426,140, Cl. 351-204.000.

Baxter Travenol Laboratories, Inc.: *See*—
Hogan, Lawrence R.; and Anderson, Lenart, 4,426,024, Cl. 222-173.000.
Wicnienski, Michael F.; and Charles, Donald E., 4,426,612, Cl. 320-39.000.

Bayer Aktiengesellschaft: *See*—
Behre, Horst; Blank, Heinz U.; Lindner, Otto; and Schossler, Willi, 4,426,334, Cl. 260-509.000.
Berneth, Horst; and Raue, Roderich, 4,426,530, Cl. 548-256.000.
Brassat, Bert; Buyach, Hans-Josef; Haupt, Heinrich; and Hermann, Karl H., 4,426,475, Cl. 524-255.000.
Claussen, Uwe, 4,426,312, Cl. 252-299.100.
Dickore, Karlfried; and Kuhle, Engelbert, 4,426,523, Cl. 544-223.000.
Hammerschmidt, Erich; Behre, Horst; Kruger, Bruno; and Winkler, Adolf, 4,426,333, Cl. 260-507.00R.
Heise, Klaus-Peter; Schneider, Ernst; and Wedemeyer, Karlfried, 4,426,538, Cl. 564-417.000.
Jautelat, Manfred; and Arlt, Dieter, 4,426,529, Cl. 548-216.000.
Konig, Eberhard; Hombach, Rudolf; Dollhausen, Manfred; and Pedain, Josef, 4,426,487, Cl. 524-710.000.
Korte, Siegfried; Lindner, Christian; Suling, Carlhans; and Ott, Karl-Heinz, 4,426,499, Cl. 525-316.000.
Maass, Gunther; Sattlegger, Hans; and Lucking, Hans J., 4,426,509, Cl. 528-34.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Fritzenwenger, Josef A.; Probst, Martin; and Schmid, Gunther, 4,425,877, Cl. 123-41.100.

Bayh, Russell I., III; and Boyle, William G., to Otis Engineering Corporation. Safety system for submersible pump. 4,425,965, Cl. 166-106.000.

Baylor, John M., to J. I. Case Company. Track joint seal assembly with interlocked thrust ring. 4,426,091, Cl. 277-83.000.

Baylou, Pierre: *See*—
Bousseau, Gerard; Baylou, Pierre; Mora, Andre; Monsion, Michel; and Bouvet, Christian, 4,425,751, Cl. 56-327.00A.

BBC Brown, Boveri & Co., Ltd.: *See*—
Braissant, Pierre; and De Mesmaeker, Ivan, 4,426,671, Cl. 361-82.000.
de Bruyne, Patrick; Jaecklin, Andre; and Eisele, Dieter, 4,426,659, Cl. 357-74.000.
Ilar, Franc; and Metzger, Fridolin, 4,426,670, Cl. 361-79.000.
Schluchter, Martin; and Voser, Max, 4,426,163, Cl. 384-428.000.

Beach, Russell J.; Bateman, Jess R.; and Carpenter, Robert L. Combined magnetic and non-magnetic locking mechanism. 4,425,771, Cl. 70-276.000.

Beacon Manufacturing Company: *See*—
Wilkerson, Forrest W., 4,426,414, Cl. 428-102.000.

Bear Automotive Service Equipment Company: *See*—
Kling, Michael J., 4,425,791, Cl. 73-117.300.

Beasley, Marvin L.; and Brennan, J. B., to Resdev, Inc. Unsaturated ethylene polymers and processes for preparing and for using same. 4,426,494, Cl. 525-86.000.

Beauducel, Claude; and Cretin, Jacques, to Institut Francais du Petrole; and Compagnie Generale de Geophysique. Device and method for amplifying and sampling multiplexed signals. 4,426,624, Cl. 330-86.000.

Becconsall, Jack K.; Cramp, John H. W.; Reid, Robert F.; Moore, Reginald C.; Rye, Barry J.; and Thomas, Eric L., to Imperial Chemical Industries Limited. Laser scanning apparatus. 4,426,640, Cl. 340-632.000.

Beck, Ronald A., to Sperry Corporation. Portable electric hot air rework tool for soldering and desoldering printed circuit assemblies. 4,426,571, Cl. 219-373.000.

Becker, Hermann-Josef. Muscle developing exercise device. 4,426,077, Cl. 272-118.000.

Beecham Group Limited: *See*—
Goudie, Alexander C., 4,426,392, Cl. 424-308.000.
Howarth, Thomas T., 4,426,377, Cl. 424-114.000.
Stirling, Irene; and Clarke, Brian P., 4,426,389, Cl. 424-272.000.

Behne, Ernest-August: *See*—
Muether, Manfred; and Behne, Ernest-August, 4,426,716, Cl. 378-38.000.

Behre, Horst; Blank, Heinz U.; Lindner, Otto; and Schossler, Willi, to Bayer Aktiengesellschaft. Process for isolating H acid and K acid. 4,426,334, Cl. 260-509.000.

Behre, Horst: *See*—
Hammerschmidt, Erich; Behre, Horst; Kruger, Bruno; and Winkler, Adolf, 4,426,333, Cl. 260-507.00R.

Beitler, Bradley D.: *See*—
Richart, Jene A.; Beitler, Bradley D.; and Deeken, David G., 4,426,173, Cl. 405-195.000.

Beleckis, Vytautas K.; and Cassidy, Raymond T., to Dennison National Company. Storage file for magnetic recording disks. 4,426,007, Cl. 211-40.000.

Bell, Clinton C. Flexographic ink distribution system. 4,425,848, Cl. 101-350.000.

Bell, John Wade: *See*—
Poffenbarger, Perry S., 4,426,642, Cl. 340-690.000.

Bell, Robert L.; Willing, Robert; and Kavli, Fred, to Kavlico Corporation. Capacitive pressure transducer and method of making same. 4,426,673, Cl. 361-283.000.

Bell Telephone Laboratories, Incorporated: *See*—
DiLorenzo, James V.; Hwang, James C.; Niehaus, William C.; Schlosser, Wolfgang O. W.; and Wemple, Stuart H., 4,426,656, Cl. 357-22.000.
Fujimura, Osamu, 4,426,722, Cl. 378-137.000.
Gritton, Charles W. K., 4,426,729, Cl. 381-41.000.
Kravitz, Stanley H.; Manocha, Ajit S.; and Willenbrock, William E., Jr., 4,426,246, Cl. 156-643.000.

Bender, Michael J., to Halogen Insulator & Seal Corp. Pressure relief exclusion seal. 4,426,090, Cl. 277-27.000.

Bendix Corporation, The: *See*—
Costello, Samuel J.; and Sohne, Eric R., 4,426,128, Cl. 339-276.00T.

Benedick, Edward H., to Regenerative Environmental Equipment Co., Inc. Thermal regeneration outlet by-pass system and process. 4,426,360, Cl. 422-173.000.

Bennett, George H.: *See*—
Ballard, John R.; Bennett, George H.; and Lee, Leslie A., 4,425,756, Cl. 60-39.092.

Bennett, M. Owen: *See*—
Cowans, Kenneth W.; and Bennett, M. Owen, 4,426,552, Cl. 381-71.000.

Berdinner, E. J., Jr. Right angle drive ratchet screw-driver. 4,425,828, Cl. 81-57.390.

Berg, Norman J.: *See*—
Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., 4,426,134, Cl. 350-358.000.

Berkebile, Lee E., to Westinghouse Electric Corp. Puffer-type compressed-gas circuit-interrupter. 4,426,561, Cl. 200-148.00A.

Berkowitz, David A.: *See*—
Porta, Livio D.; Berkowitz, David A.; Withuhn, William L.; and Hamilton, Carl C., 4,425,763, Cl. 60-693.000.

Berner, Godwin, to Ciba-Geigy Corporation. Stabilization of acid catalyzed stoving lacquers. 4,426,471, Cl. 524-91.000.

Berner, Godwin, to Ciba-Geigy Corporation. Light stabilization of metallic lacquers. 4,426,472, Cl. 524-99.000.

Berneth, Horst; and Raue, Roderich, to Bayer Aktiengesellschaft. Triazolylcoumarin compounds, and their preparation and use as optical brighteners, scintillators and laser dyestuffs. 4,426,530, Cl. 548-256.000.

Bernstein, Lennart. Boiler for a heating system, as an article of manufacture, a boiler-heating system combination, and a method for heating a heat-transfer medium such as water in a heating system. 4,426,037, Cl. 237-19.000.

Bertoldo, Gene: *See*—
Intrater, Josef; and Bertoldo, Gene, 4,426,423, Cl. 428-408.000.

Berzin, Evgeny K.; Miroshnichenko, Anatoly G.; and Yantovsky, Leonid I. Electrical machine with superconducting inductor and gas cooling of normal-conductivity windings. 4,426,592, Cl. 310-52.000.

Besnard, Francois: *See*—
Fournie, Rene; Besnard, Francois; Hons-Olivier, Jacques; and Pierre, Alexandre, 4,426,086, Cl. 277-1.000.

Beth Israel Hospital: *See*—
Simon, Morris, 4,425,908, Cl. 128-1.00R.

Bhatia, Harsaran S.; Eardley, David B.; and Gaur, Santosh P., to International Business Machines Corporation. Memory cell resistor device. 4,426,655, Cl. 357-21.000.

Bhojwani, Arju H.: *See*—
Woebcke, Herman N.; Bhojwani, Arju H.; and Gartside, Robert J., 4,426,359, Cl. 422-145.000.

Bice, William L.; Graves, Ernest D., Jr.; and Wagener, Gerald P., to Dow Chemical Company, The. Prediction of extrusion performance of polymers. 4,425,790, Cl. 73-55.000.

Bienvenu, Joseph O.: *See*—
Bolton, Malcolm E.; and Bienvenu, Joseph O., 4,426,229, Cl. 106-270.000.

Bigalke, Erhard, to Volkswagenwerk Aktiengesellschaft. Circuit for generating a rotating field for a three phase synchronous motor serving as a flywheel starter for a vehicle internal combustion engine. 4,426,585, Cl. 290-38.00B.

Billoux, Yves J.: *See*—
Sandri, Joseph M.; Calentine, John W.; Linder, Seymour M.; and Billoux, Yves J., 4,426,503, Cl. 526-263.000.

BioResearch Inc.: *See*—
Conti, James C.; Strope, Elaine; Findl, Eugene; and Griffiths, Cynthia, 4,425,922, Cl. 128-691.000.

Bison, Gunter; Linkat, Norbert; and Wolfes, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of 1H-tetrazole-1 compounds using trimethylsilyl azide. 4,426,531, Cl. 548-253.000.

Bissonnette, Gaston. Foot-rest assembly for a fishing chair. 4,426,115, Cl. 297-423.000.

Black & Decker Inc.: *See*—
Bowron, Howard J., 4,426,062, Cl. 251-7.000.

Black, Homer D.; and Stribley, Charles R., to Sperry Corporation. Differential linkage apparatus for an aircraft series servoactuator apparatus. 4,426,607, Cl. 318-628.000.

Blanchard, Gilbert; Brunelle, Jean-Pierre; and Prigent, Michel, to Procatalyse. Catalyst for treatment of exhaust gases from internal combustion engines. 4,426,319, Cl. 502-241.000.

Blancke, Bernard: *See*—
Hubert, Bernard; and Blancke, Bernard, 4,426,052, Cl. 244-168.000.

Blanco, Fernando E., to Products Research & Chemical Corp. Alpha-beta unsaturated ureide polymers, method for making same and cured elastomers produced therefrom. 4,426,506, Cl. 526-302.000.

Blank, Heinz U.: *See*—
Behre, Horst; Blank, Heinz U.; Lindner, Otto; and Schossler, Willi, 4,426,334, Cl. 260-509.000.

Blattermann, Karl-Gunther; Neuhaus, Gunter; and Nolte, Guther, to Conrad Scholtz AG. Cover belt conveyor. 4,425,995, Cl. 198-605.000.

Bloom, William G.: *See*—
Alston, William W., Jr.; Bloom, William G.; and Johnson, William C., 4,425,919, Cl. 128-658.000.

Boeing Commercial Airplane Company: *See*—
Banks, Eddie D.; Simmons, Gerald C.; and Roberts, Roger F., 4,426,051, Cl. 244-137.00R.

Boeing Company, The: *See*—
Miles, Ronald N., 4,425,980, Cl. 181-208.000.
Wang, Timothy, 4,426,054, Cl. 244-212.000.

Bohg, Armin; and Hartmann, Kurt, to International Business Machines Corporation. Bank for accommodating several print ram units. 4,425,845, Cl. 101-93.340.

Bohlen, Harald; Engelke, Helmut; Greschner, Johann; and Nehmiz, Peter, to International Business Machines Corporation. Method of compensating the proximity effect in electron beam projection systems. 4,426,584, Cl. 250-492.200.

Boliden Aktiebolag: *See*—
Malmqvist, Erik L.; and Kristiansson, Krister, 4,426,575, Cl. 250-253.000.

Bolton, Malcolm E.; and Bienvenu, Joseph O., to Petrolite Corporation. Oxidized alpha-olefins. 4,426,229, Cl. 106-270.000.

Bonaguidi, Orland H. Inverted roof system. 4,425,746, Cl. 52-309.120.

Bonnel, Madeleine: *See*—
Moris, Francois; Favennec, Jean-Luc; and Bonnel, Madeleine, 4,426,407, Cl. 427-86.000.

Bonniot, Claude: *See*—
Bastenhof, Dirk; Brisson, Roger; and Bonniot, Claude, 4,426,198, Cl. 417-494.000.

Boozer, Wilson O., III: *See*—
Driscoll, Michael E.; and Boozer, Wilson O., III, 4,426,245, Cl. 156-511.000.

Borch, Richard F., to University of Minnesota, Regents of the. Inhibition of undesired effects of platinum(II) compounds. 4,426,372, Cl. 424-10.000.

Borden (UK) Limited: *See*—
Quist, Ingmar P.; Railton, Jeffrey D.; and Lemon, Peter H. R. B., 4,426,467, Cl. 523-145.000.

Borg-Warner Chemicals, Inc.: *See*—
Falk, John C., 4,426,493, Cl. 525-84.000.

Borg-Warner Corporation: *See*—
Wiese, Winfred J., 4,426,092, Cl. 277-96.100.

Bormioli, Giorgio. Terminal pipe fitting provided with a self-locking device for the releasable coupling to a flanged mouth, particulary for the loading of a fluid oil product into a lorry tank. 4,426,063, Cl. 251-149.900.

Boroschewski, Gerhard; Nusslein, Ludwig; and Arndt, Friedrich, to Schering Aktiengesellschaft. Carbaminic acid esters with herbicidal properties. 4,426,222, Cl. 71-111.000.

Borroni, Pierantonio: *See*—
Ronchetti, Camillo; Borroni, Pierantonio; and Buzzanca, Giovanni, 4,426,618, Cl. 324-65.0CR.

Bosch, Erhard: *See*—
Sommer, Oswin; Dorsch, Norman; Bosch, Erhard; Schiller, August; and Strasser, Alois, 4,426,474, Cl. 524-243.000.

Boschaert, Hendrik, to Wetenschappelijk en Technisch Onderzoekscentrum voor Diamant. Method and apparatus for bruting precious or semi-precious stones. 4,425,900, Cl. 125-30.00R.

Botez, Dan, to RCA Corporation. Constricted double heterostructure semiconductor laser. 4,426,701, Cl. 372-45.000.

Bott, John A. Luggage carrier with illuminating means. 4,426,028, Cl. 224-325.000.

Boucher, Harry; and Hubbard, Jack L. Hermetically sealed tank gauge apparatus. 4,425,796, Cl. 73-312.000.

Boulanger, Henry J., to Texas Instruments Incorporated. Snap-acting thermostatic switch using inflexible, spring biased contact arm. 4,426,632, Cl. 337-347.000.

Bounie, Paul: *See*—
Plaquin, Bernard; Bounie, Paul; and Mantelle, Jean, 4,426,105, Cl. 285-92.000.

Bourland, Joe D.; Geddes, Leslie A.; Babbs, Charles F.; and Tacker, Willis A., Jr., to Purdue Research Foundation. Apparatus and method for measurement and control of blood pressure. 4,425,920, Cl. 128-672.000.

Bousseau, Gerard; Baylou, Pierre; Mora, Andre; Monsion, Michel; and Bouvet, Christian, to Ecole Nationale Superieure d'Electricite et de Radioelectricite de Bordeaux (E.N.S.E.R.B.) U.E.R. Derogatoire de l'Universite de Bordeaux. Automatic asparagus picking machine. 4,425,751, Cl. 56-327.00A.

Bouvet, Christian: *See*—
Bousseau, Gerard; Baylou, Pierre; Mora, Andre; Monsion, Michel; and Bouvet, Christian, 4,425,751, Cl. 56-327.00A.

Bowen, Mark, to Therapeutic Products, Inc. Cap structure for creating temperature controlled environment for reducing alopecia. 4,425,916, Cl. 128-403.000.

Bowling, Stephen R., to Qume Corporation. Modular printer with coded plug compatible modules. 4,426,166, Cl. 400-62.000.

Bowron, Howard J., to Black & Decker Inc. Fluid flow control valves. 4,426,062, Cl. 251-7.000.

Boyland, Ernest E., to Quikstak, Inc. Bag palletizer. 4,426,184, Cl. 414-82.000.

Boyle, William G.: *See*—
Bayh, Russell I., III; and Boyle, William G., 4,425,965, Cl. 166-106.000.

Bradcovich, James M.; Wake, Robert H.; Kovacs, Richard M., Jr.; and Pinkstaff, Carlos D., to Technicare Corporation. Support structure for rotatable scintillation detector. 4,426,578, Cl. 250-363.00S.

Bradford, Robert S.; Brookhart, Marshall R.; and Dy, Bennett G., to Minnesota Mining and Manufacturing Company. Automatic track following feature for helical video recorder. 4,426,665, Cl. 360-10.200.

Brailsford, Michael I. D. Stripper system for surfaces. 4,426,250, Cl. 156-655.000.

Braissant, Pierre; and De Mesmaeker, Ivan, to BBC Brown, Boveri & Co., Ltd. Process and apparatus for the short-circuit protection of A.C. circuits. 4,426,671, Cl. 361-82.000.

Brandelong, Gerard: *See*—
Lainez, Lucien; Brandelong, Gerard; and Jacquemin, Marie N., 4,426,122, Cl. 339-45.00M.

Brandner, Alexander; and Zengel, Hand G., to Akzo NV. Cellulosic molding and spinning compound with low contents of low-molecular decomposition products. 4,426,228, Cl. 106-203.000.

Brassat, Bert; Buysch, Hans-Josef; Haupt, Heinrich; and Hermann, Karl H., to Bayer Aktiengesellschaft. Stabilized polyamides. 4,426,475, Cl. 524-255.000.

Breault, Richard D.: *See*—
Goller, Glen J.; Breault, Richard D.; and Smith, J. Harold, 4,426,340, Cl. 264-29.100.

Breitenstein, Werner: *See*—
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, 4,426,380, Cl. 424-244.000.

Bremer, Noel J.: *See*—
Dria, Dennis E.; and Bremer, Noel J., 4,426,342, Cl. 264-109.000.

Brenden, Byron B.; and Russell, James T., to Digital Recording Corp.; and Digital Recording Corp. Optical playback apparatus focusing system for producing a prescribed energy distribution along an axial focal zone. 4,426,696, Cl. 369-112.000.

Brenig, Theodore, to General Electric Company. Voice-controlled operator-interacting radio transceiver. 4,426,733, Cl. 455-79.000.

Brennan, J. B.: *See*—
Beasley, Marvin L.; and Brennan, J. B., 4,426,494, Cl. 525-86.000.

Brewer, Robert A. Key labeling system. 4,425,772, Cl. 70-456.00R.

Bridgestone Tire Co., Ltd.: *See*—
Narumiya, Tsuneaki, 4,426,287, Cl. 210-184.000.
Watabe, Yoji; Takeichi, Hideo; and Irako, Koichi, 4,426,459, Cl. 521-42.000.

Briggs, Paul C., to Illinois Tool Works Inc. Room-temperature-curable, quick-setting acrylic/epoxy adhesives and methods of bonding. 4,426,243, Cl. 156-307.300.

Bright, Margaret N.: *See*—
Ong, S. Christine; and Bright, Margaret N., 4,426,346, Cl. 264-290.200.

Brisson, Roger: *See*—
Bastenhof, Dirk; Brisson, Roger; and Bonniot, Claude, 4,426,198, Cl. 417-494.000.

Bristol-Myers Company: *See*—
Cundall, Robert L.; and Walker, Derek, 4,426,520, Cl. 544-30.000.

Bristow, Ian T.; and Wilson, Peter A. E., to Hobourn-Eaton Limited. Oil supply system. 4,426,196, Cl. 417-282.000.

British Petroleum Company Limited, The: *See*—
Brown, David E.; and Mahmood, Mahmood N., 4,426,269, Cl. 204-242.000.

Brodell, Robert F.; and Comeau, Roger J., to United Technologies Corporation. Flow directing assembly for a gas turbine engine. 4,426,191, Cl. 415-189.000.

Brookhart, Marshall R.: *See*—
Bradford, Robert S.; Brookhart, Marshall R.; and Dy, Bennett G., 4,426,665, Cl. 360-10.200.

Brooks, Mark A.; and Miler, Jane. Method of fabricating a pressure sensor. 4,426,406, Cl. 427-58.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Ishitani, Eiichi, 4,425,859, Cl. 112-158.00R.
Jozuka, Masao; and Ohmura, Kazuhiro, 4,426,168, Cl. 400-224.000.

Brown, Alfred; and Hall, Wilbur L., to Texaco Inc. Selective water exclusion. 4,425,968, Cl. 166-295.000.

Brown, David E.; and Mahmood, Mahmood N., to British Petroleum Company Limited, The. Method of stabilizing electrodes coated with mixed oxide electrocatalysts during use in electrochemical cells. 4,426,269, Cl. 204-242.000.

Brown, Richard; and Jozwiak, Phillip C., to RCA Corporation. Composition and thickness variation in dielectric layers. 4,426,249, Cl. 156-653.000.

Browning, Thomas, to Courtaulds Limited. Drying wood pulp in the presence of an alkali metal sulphite. 4,426,258, Cl. 162-23.000.

Brunelle, Jean-Pierre: *See*—
Blanchard, Gilbert; Brunelle, Jean-Pierre; and Prigent, Michel, 4,426,319, Cl. 502-241.000.

Brunette Machine Works, Ltd.: *See*—
Pousette, Ronald D.; and Sanders, John L., 4,425,951, Cl. 144-208.00E.
Pousette, Ronald D.; and Sanders, John L., 4,425,952, Cl. 144-246.00F.
Bruni, Maurice; and Duboz, George, to L'Air Liquide-Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Stable ternary cryogenic fuel having density in the gaseous state less than that of air. 4,426,207, Cl. 44-50.000.
Brunsch, Arwed; Ruh, Wolf-Dieter; and Trippel, Gerhard, to International Business Machines Corporation. Method of producing a metallic thin film magnetic disk. 4,426,265, Cl. 204-192.00M.
Brunswick Corporation: *See*—
Gifford, Richard L., 4,426,045, Cl. 242-84.20G.
Bryant, Donald L.: *See*—
Puckett, Joe D.; and Bryant, Donald L., 4,426,286, Cl. 210-121.000.
Bryer, Philip. Transducer positioner in disk files. 4,426,669, Cl. 360-106.000.
Buchenauer, C. Jerald, to United States of America, Energy. Analog quadrature signal to phase angle data conversion by a quadrature digitizer and quadrature counter. 4,426,620, Cl. 324-83.00D.
Buda, John J. Automatic paper roller release mechanism for teletype and electric typewriters. 4,426,170, Cl. 400-636.100.
Buehler, Charles K.: *See*—
Fries, Richard W.; and Buehler, Charles K., 4,426,318, Cl. 502-154.000.
Buffington, Sherry; and Wilson, Leonard T., to Ortho Diagnostic Systems Inc. Antibody elution reagent kit. 4,426,357, Cl. 422-61.000.
Buhler, Arthur: *See*—
Adam, Jean-Marie; and Buhler, Arthur, 4,426,328, Cl. 260-162.000.
Buljan, Sergej-Tomislav: *See*—
Sarin, Vinod K.; and Buljan, Sergej-Tomislav, 4,426,209, Cl. 51-295.000.
Buratti, Massimo: *See*—
Di Russo, Ettore; Buratti, Massimo; and Veronelli, Silvano, 4,426,429, Cl. 428-654.000.
Burchfield, Robert W., to Eli Lilly and Company. Purification of syn-(2-aminothiazol-4-yl)methoxyimino)acetic acid. 4,426,528, Cl. 548-194.000.
Burgdorf, Jochen; and Keiner, Karl, to ITT Industries, Inc. Brake pressure control valve and a method for its assembly. 4,426,117, Cl. 303-6.00C.
Burger, Joseph M., to Combustion Engineering, Inc. Spacer grid for nuclear fuel assembly. 4,426,355, Cl. 376-442.000.
Burlington Industries, Inc.: *See*—
Wang, Kenneth Y., 4,426,244, Cl. 156-498.000.
Burns, Daniel E., to Demco, Inc. Icing apparatus for pallet supported cartons. 4,425,768, Cl. 62-237.000.
Bushnell, James D., to Exxon Research and Engineering Co. Extraction zone tray. 4,426,361, Cl. 422-256.000.
Butler, Barry L., to United States of America, Energy. Tracking system for solar collectors. 4,425,904, Cl. 126-424.000.
Butler, George T., to Frank R. Ford Limited. Document shredding machines. 4,426,044, Cl. 241-236.000.
Butler, L. Dennis, to Sperry Corporation. Automatic control linkage for round bale wagon. 4,426,183, Cl. 414-24.500.
Butterwick, Gilbert N., to RCA Corporation. Photomultiplier tube having a heat shield with alkali vapor source attached thereto. 4,426,596, Cl. 313-534.000.
Buttner, Robert C., to Concrete Pipe & Products Corp. Flexible seal. 4,426,095, Cl. 277-207.00A.
Buysch, Hans-Josef: *See*—
Brassat, Bert; Buysch, Hans-Josef; Haupt, Heinrich; and Hermann, Karl H., 4,426,475, Cl. 524-255.000.
Buzzanca, Giovanni: *See*—
Ronchetti, Camillo; Borroni, Pierantonio; and Buzzanca, Giovanni, 4,426,618, Cl. 324-65.0CR.
Bybee, Richard T.; Paulson, Arnold E.; and Warren, Holland D., to Babcock & Wilcox Company, The. Composite detector. 4,426,352, Cl. 376-255.000.
"C.G.R. MeV": *See*—
Leboutet, Hubert, 4,426,351, Cl. 376-158.000.
C-I-L Inc.: *See*—
Jorgenson, Gordon K., 4,425,849, Cl. 102-275.120.
C.I.S.E. SpA: *See*—
Ronchetti, Camillo; Borroni, Pierantonio; and Buzzanca, Giovanni, 4,426,618, Cl. 324-65.0CR.
C. S. Fudickar K.G.: *See*—
Fudickar, Carl S.; and Thies, Peter, 4,426,573, Cl. 219-544.000.
Cabrera-Montante, Armando; and Ogushi-Perez, Jose J., to Vitro Tec Fideicomiso. Machine for handling and cooling hot glasswares articles. 4,426,218, Cl. 65-241.000.
Cain, Paul A., to Union Carbide Corporation. Insecticidal bicycloxyphenyl ureas. 4,426,385, Cl. 424-263.000.
Cain, Troy D.: *See*—
Frias, Robert; and Cain, Troy D., 4,426,182, Cl. 414-22.000.
Calentine, John W.: *See*—
Sandri, Joseph M.; Calentine, John W.; Linder, Seymour M.; and Billioux, Yves J., 4,426,503, Cl. 526-263.000.
Calfo, Frederick D.; and Lupton, Michael W., to United States of America, National Aeronautics and Space Administration. Micronized coal burner facility. 4,425,854, Cl. 110-262.000.
Callison, Gordon. Heat exchange device. 4,425,901, Cl. 126-6.000.
Calumite Company, The: *See*—
Hopkins, Robert W., 4,426,067, Cl. 266-191.000.
Cameron, William M., to Macewans Machinery Limited. Heating apparatus. 4,425,962, Cl. 165-92.000.
Campbell, Willis R.: *See*—
Sheesley, Donald L.; and Campbell, Willis R., 4,425,752, Cl. 56-341.000.
Canadian Fram Limited: *See*—
Cook, John E., 4,425,940, Cl. 137-627.500.
Canon Kabushiki Kaisha: *See*—
Aguro, Yoshinori; and Torigai, Akiyoshi, 4,426,151, Cl. 355-15.000.
Iura, Yukio; Yamamichi, Masayoshi; Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 4,426,142, Cl. 354-412.000.
Ohta, Tokuya; and Eida, Tsuyoshi, 4,426,226, Cl. 106-22.000.
Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; Moriwaki, Masazumi; Mochizuki, Noritaka; Minami, Setsuo; and Matsui, Yoshiya, 4,426,132, Cl. 350-167.000.
Canron Inc.: *See*—
Naggar, Rolando, 4,425,969, Cl. 171-16.000.
Cap Cutters, Inc.: *See*—
Mason, Michael P.; and Scaran, Robert R., 4,425,710, Cl. 30-229.000.
Capdevielle, Martin J.: *See*—
Kulischenko, Walter; and Capdevielle, Martin J., 4,425,823, Cl. 74-665.0GE.
Cardillo, Joseph S.: *See*—
McJones, Robert W.; McCarty, Robert S.; and Cardillo, Joseph S., 4,425,893, Cl. 123-446.000.
Cargille, Donald R., to Hughes Aircraft Company. Adaptive comparator. 4,426,591, Cl. 307-358.000.
Carl Schleicher & Schull GmbH & Co. KG: *See*—
Hese, Nils; Seeling, Alfred; and Weisweiler, Manfred, 4,426,204, Cl. 8-492.000.
Carlson, Robert G., to United States of America, Air Force. Impact composite blade. 4,426,193, Cl. 416-229.00A.
Carlsson, Per A. E.: *See*—
Arvidsson, Folke L.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Lindberg, Per. L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Nils U. E.; and Wikstrom, Hakan V., 4,426,386, Cl. 424-267.000.
Carlton Company: *See*—
Atkinson, Renwick S., 4,425,830, Cl. 83-833.000.
Carnegie-Mellon University: *See*—
Asada, Haruhiko; and Kanade, Takeo, 4,425,818, Cl. 74-469.000.
Carpenter, Robert L.: *See*—
Beach, Russell J.; Bateman, Jess R.; and Carpenter, Robert L., 4,425,771, Cl. 70-276.000.
Carrick, David T.: *See*—
Tovey, Keith C.; and Carrick, David T., 4,426,455, Cl. 436-505.000.
Carrier Corporation: *See*—
Torniainen, Matti J., 4,425,696, Cl. 29-157.3AH.
Carrington, James E.; Hryck, Michael D.; Skinner, Dean W.; and Westcott, Gerald R., to International Business Machines Corporation. Home pulse compensation for multiple speed line printer. 4,425,844, Cl. 101-93.140.
Carson, Don B., to UOP Inc. Power recovery in motor fuel alkylation process. 4,426,544, Cl. 585-709.000.
Casablanca Fan Company, Inc.: *See*—
Dennis, Warren E., 4,426,677, Cl. 362-438.000.
Dennis, Warren E., 4,426,677, Cl. 362-438.000.
Casio Computer Co., Ltd.: *See*—
Kosaka, Kazumitu; Kido, Yukio; Katoh, Shigeru; and Tsutsui, Hitoshi, 4,426,159, Cl. 368-90.000.
Casma di V. Marinoni & Figli: *See*—
Marinoni, Mario; and Marinoni, Mirko, 4,425,939, Cl. 137-599.200.
Cassar, Luigi: *See*—
Rochat, Alain C.; and Cassar, Luigi, 4,426,533, Cl. 548-471.000.
Casseday, Michael W.: *See*—
Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., 4,426,134, Cl. 350-358.000.
Cassidy, Raymond T.: *See*—
Beleckis, Vytautas K.; and Cassidy, Raymond T., 4,426,007, Cl. 211-40.000.
Caterpillar Tractor Co.: *See*—
Chambers, Robert O.; and Ogden, Marion E., 4,425,825, Cl. 74-804.000.
Schexnayder, Lawrence F.; and Thies, Jerome A., 4,425,758, Cl. 60-403.000.
Cecchini, Albert B. P., to Warren Erection Co., Inc. Drag responsive regulated voltage power generation. 4,426,586, Cl. 290-44.000.
Cetus Corporation: *See*—
Geigert, John; and Neidleman, Saul L., 4,426,449, Cl. 435-155.000.
Chadshay, Roman, to Combustion Engineering, Inc. Secondary air control damper arrangement. 4,425,855, Cl. 110-263.000.
Chaitin, Leonard J.: *See*—
Masher, Dale P.; and Chaitin, Leonard J., 4,426,667, Cl. 360-44.000.
Chambers, Robert O.; and Ogden, Marion E., to Caterpillar Tractor Co. Geared input mechanism for a torque converter. 4,425,825, Cl. 74-804.000.
Champoux, Louis A., to Fatigue Technology, Inc. Apparatus having extended prestressing and sleeve retaining devices for prestressing countersunk fastener holes and method. 4,425,780, Cl. 72-370.000.
Chang, John C. C., to Minnesota Mining and Manufacturing Company. Textile treatments. 4,426,476, Cl. 524-288.000.
Chang, Tai-Hon P.; Coane, Phillip J.; Hohn, Fritz-Jurgen; and Kern, Dieter P., to International Business Machines Corporation. Electron beam potential switching apparatus. 4,426,583, Cl. 250-398.000.

Chao, Tai-Hsiang: *See*—
Antos, George J.; and Chao, Tai-Hsiang, 4,426,279, Cl. 208-138.000.

Chapuis, Claude: *See*—
Thouault, Alain; Chapuis, Claude; and Austruy, Georges, 4,425,902, Cl. 126-360.00R.

Charles, Donald E.: *See*—
Wicnienski, Michael F.; and Charles, Donald E., 4,426,612, Cl. 320-39.000.

Chatzipetros, Johann; and Helten, Manfred, to Kernforschungsanlage Julch GmbH. Cryogenic pump and air sampler. 4,425,811, Cl. 73-863.110.

Cheetham, Eric C. Apparatus and method for X-ray beam alignment. 4,426,726, Cl. 378-206.000.

Chen, Chung-Hsuan: *See*—
Hurst, G. Samuel; Payne, Marvin G.; Chen, Chung-Hsuan; and Parks, James E., 4,426,576, Cl. 250-283.000.

Chen, Evan N., to Warner-Lambert Company. Razor with lever operated blade cover. 4,425,705, Cl. 30-84.000.

Chen, Paul Y.; and Madgavkar, Ajay M., to Occidental Petroleum Corporation. Process for removing nitrogen from shale oil. 4,426,280, Cl. 208-254.00R.

Chenin, Claude; Krawczyk, Rodolphe; Marello, Georges; and Lombard, Jean-Yves, to Societe Nationale Industrielle Aerospatiale. Mechanical release device for example for satellite. 4,426,053, Cl. 244-173.000.

Chenot, Charles F.; and Walter, Wolfgang, to GTE Products Corporation. Standard white fluorescent lamps employing blend. 4,426,600, Cl. 313-487.000.

Cherchian Ara A.; Elert, Karl; and Ast, Gunther E., to Jos. Schlitz Brewing Company. Can body. 4,426,013, Cl. 220-66.000.

Chernoff, Edward A.; and Levy, Paul, to Motors & Armatures, Inc. Universally mountable motors. 4,426,593, Cl. 310-91.000.

Chertok, Allan; Donahue, Joel; and Widnall, William, to U.S. Windpower, Inc. Method and apparatus for controlling windmill blade pitch. 4,426,192, Cl. 416-1.000.

Chevron Research Company: *See*—
Edwards, Laroy H., 4,426,379, Cl. 424-200.000.
Simon, Ralph; and Schmidt, Raymond L., 4,425,810, Cl. 73-863.110.

Child, Francis W. Dispenser. 4,425,874, Cl. 119-156.000.

Chiu, Jessie T.: *See*—
Ornum, Joel V.; and Chiu, Jessie T., 4,426,468, Cl. 523-166.000.

Chivens, Clyde C.: *See*—
Willis, William; and Chivens, Clyde C., 4,425,715, Cl. 33-199.00R.

Choice Vend Industries, Inc.: *See*—
Croteau, James; and Enders, John A., 4,426,016, Cl. 221-75.000.

Chollet, Francis, to Framatome. Device for the disengagement of a nuclear reactor fuel element from an articulated finger grapnel and method of using same. 4,426,353, Cl. 376-262.000.

Christ, Ferdinand: *See*—
Weber, Otto; Ohnsmann, Klaus; and Christ, Ferdinand, 4,426,189, Cl. 414-786.000.

Christensen, Curtis M. Automatic threshold seal for a door. 4,425,738, Cl. 49-310.000.

Chugunny, Evgeny G.: *See*—
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Ciba Geigy AG: *See*—
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Ciba-Geigy Corporation: *See*—
Abel, Heinz; and Oxe, Josef, 4,426,203, Cl. 8-138.000.
Adam, Jean-Marie; and Buhler, Arthur, 4,426,328, Cl. 260-162.000.
Berner, Godwin, 4,426,471, Cl. 524-91.000.
Berner, Godwin, 4,426,472, Cl. 524-99.000.
Martin, Henry, 4,426,221, Cl. 71-105.000.
Rochat, Alain C.; and Cassar, Luigi, 4,426,533, Cl. 548-471.000.
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, 4,426,380, Cl. 424-244.000.

CII Honeywell Bull: *See*—
Bacot, Pierre C. A.; and Isert, Michel, 4,426,681, Cl. 364-200.000.

Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., to Diversey Corporation, The. Compositions for souring and softening laundered textile materials, and stock solutions prepared therefrom. 4,426,304, Cl. 252-8.750.

Cities Service Company: *See*—
Rogers, Thomas K., 4,426,317, Cl. 502-120.000.

Claas OHG: *See*—
Kersting, Hermann; and Roderfeld, Heinrich, 4,425,925, Cl. 130-22.00A.

Claussen, Peter; and Zeiringer, Rudolf, to List, Hans. Means for ascertaining the internal pressure in a pressure pipe system. 4,425,800, Cl. 73-730.000.

Clarion Co., Ltd.: *See*—
Hamada, Masanori, 4,426,727, Cl. 381-13.000.
Mori, Masaharu, 4,426,732, Cl. 455-263.000.
Mori, Masaharu, 4,426,737, Cl. 455-260.000.

Clarke, Brian P.: *See*—
Stirling, Irene; and Clarke, Brian P., 4,426,389, Cl. 424-272.000.

Clarke, David: *See*—
Bailey, Joseph; Clarke, David; and Johnston, Linda G., 4,426,326, Cl. 260-146.00R.

Claussen, Uwe, to Bayer Aktiengesellschaft. Liquid crystal material containing disazo dyestuffs. 4,426,312, Cl. 252-299.100.

Claypole, George M., to General Motors Corporation. Motor vehicle cooling fan power management system. 4,425,766, Cl. 62-133.000.

Cline, Charles D., to Rockwell International Corporation. Extraction tool for electrical connector latch. 4,425,704, Cl. 29-764.000.

Coach and Car Equipment Corporation: *See*—
Kehl, Norman J.; and Magnuson, Richard C., 4,426,114, Cl. 297-232.000.

Coane, Phillip J.: *See*—
Chang, Tai-Hon P.; Coane, Phillip J.; Hohn, Fritz-Jurgen; and Kern, Dieter P., 4,426,583, Cl. 250-398.000.

Coca-Cola Company, The: *See*—
Sedam, Jason K., 4,426,019, Cl. 222-88.000.

Cochoy, Robert E.: *See*—
Shackelford, Scott A.; McGuire, Raymond R.; and Cochoy, Robert E., 4,426,540, Cl. 568-590.000.

Cognion, Jean-Marie: *See*—
Kervennal, Jacques; and Cognion, Jean-Marie, 4,426,515, Cl. 528-210.000.

Cohen, Theodore; and Matz, James, to University of Pittsburgh. Method of synthesizing brevicomin and using same in beetle control. 4,426,535, Cl. 549-397.000.

Cohen, Zachariha. Screw feed/ram injector. 4,426,201, Cl. 425-147.000.

Cole, Robert C.; Gaspar, Richard A.; Stackhouse, Donald C.; and Trentman, John L., to Harris Corporation. Glue application system for a collating machine. 4,426,072, Cl. 270-53.000.

Coleman, Michael G.; and Lesk, Israel A., to Weiss, Harry M. Lubricated tissue. 4,426,418, Cl. 428-211.000.

Colgate-Palmolive Co.: *See*—
Morton, Anthony J.; and Harvey, Kenneth, 4,426,373, Cl. 424-52.000.
Verunica, Pierre M., 4,426,310, Cl. 252-106.000.

Coltman, Bertram W., Jr., to Republic Molding Corporation. Closure for open mouth container. 4,426,014, Cl. 220-307.000.

Columbus, Richard L., to Eastman Kodak Company. Multi-zoned reaction vessel having pressure-actuatable control means between zones. 4,426,451, Cl. 436-518.000.

Combustion Engineering, Inc.: *See*—
Burger, Joseph M., 4,426,355, Cl. 376-442.000.
Chadshay, Roman, 4,425,855, Cl. 110-263.000.

Comeau, Roger J.: *See*—
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Commissariat a l'Energie Atomique: *See*—
Denoyer, Serge; Guerin, Jacques; Labrot, Maxime; and Serrano, Jean-Pierre, 4,426,597, Cl. 313-231.410.

Commonwealth of Australia, The: *See*—
Mildren, Michael T., 4,426,048, Cl. 244-3.230.

Compagnie Generale de Geophysique: *See*—
Beauducel, Claude; and Cretin, Jacques, 4,426,624, Cl. 330-86.000.

Concrete Pipe & Products Corp.: *See*—
Buttner, Robert C., 4,426,095, Cl. 277-207.00A.

Conoco Inc.: *See*—
Rutledge, Gerald D.; and Yoon, Heeyoung, 4,425,876, Cl. 123-3.000.

Conover, Clarence G. Apparatus for removing stakes from the ground. 4,425,722, Cl. 37-2.00P.

Conrad Scholtz AG: *See*—
Blattermann, Karl-Gunther; Neuhaus, Gunter; and Nolte, Guther, 4,425,995, Cl. 198-605.000.

Consolidated Papers, Inc.: *See*—
Gebert, Kenneth W.; and Rajski, Pat A., 4,426,412, Cl. 427-356.000.

Conti, James C.; Strope, Elaine; Findl, Eugene; and Griffiths, Cynthia, to BioResearch Inc. Electrical method and apparatus for non-invasively detecting abnormal flow in conduits. 4,425,922, Cl. 128-691.000.

Continental Group, Inc., The: *See*—
Krishnakumar, Suppayan M.; Pocock, John F. E.; and Harry, Ieuan L., 4,426,202, Cl. 425-534.000.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Rohde, Dieter; and Preatorius, Siegfried, 4,425,953, Cl. 152-360.000.

Continental-Wirt Electronics Corp.: *See*—
Quigley, Thomas J., 4,426,557, Cl. 200-16.00D.

Cook, John E., to Canadian Fram Limited. Pressure control system. 4,425,940, Cl. 137-627.500.

Cooley, Harold J.; and DiIanni, Elmo J., to United States of America, Army. Linearization of sampled Geiger-Mueller radiation detector. 4,426,579, Cl. 250-374.000.

Cooper, Hal B. H. Removal and recovery of nitrogen oxides and sulfur dioxide from gaseous mixtures containing them. 4,426,364, Cl. 423-235.000.

Cope, Geoffrey W.: *See*—
Adams, George E., III; Bailey, Edwin C.; Klimowicz, Richard F.; and Cope, Geoffrey W., 4,426,012, Cl. 213-135.000.

Copeland, James L.; Fernholz, Peter J.; Larson, Spencer B.; Salmonson, Duane L.; and Weick, Michael D., to Economics Laboratory, Inc. Solid block detergent dispenser. 4,426,362, Cl. 422-263.000.

Cornell, Stephen W.; and Johns, Don H. Method of making composite polyolefin based containers. 4,426,347, Cl. 264-294.000.

Corning Glass Works: *See*—
Tick, Paul A., 4,426,430, Cl. 429-103.000.

Costello, Samuel J.; and Sohne, Eric R., to Bendix Corporation, The. Brush contacts. 4,426,128, Cl. 339-276.00T.

Cotton Incorporated: *See*—
Winch, Allen R.; and Rearick, William A., 4,425,842, Cl. 100-37.000.

Couderc, Pierre, to Huiles, Goudrons et Derives. Device for measuring the deformation of a material under the influence of heat and its application to the determination of the wetting power of pitches. 4,426,160, Cl. 374-45.000.

Coughlin, William J.; Rieppel, Perry J.; and Hoffman, Stephen A., to Arcair Company. Apparatus for collecting process generated fume and/or slag. 4,426,566, Cl. 219-137.410.

Council for Mineral Technology: *See*—
Curr, Thomas R.; and Barcza, Nicholas A., 4,426,223, Cl. 75-10.00R.

Courtaulds Limited: *See*—
Browning, Thomas, 4,426,258, Cl. 162-23.000.

Cowans, Kenneth W.; and Bennett, M. Owen. Speaker distortion compensator. 4,426,552, Cl. 381-71.000.

Cox, James P. Shoe cleaner. 4,425,677, Cl. 15-104.920.

Cramer, John J.: *See*—
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,426,304, Cl. 252-8.750.

Cramp, John H. W.: *See*—
Becconsall, Jack K.; Cramp, John H. W.; Reid, Robert F.; Moore, Reginald C.; Rye, Barry J.; and Thomas, Eric L., 4,426,640, Cl. 340-632.000.

Crane, Robert L. Cushion to reduce the incidence of decubitus ulcers in immobilized patients. 4,425,676, Cl. 5-450.000.

Crawford, Christopher L., to AMP Incorporated. Flat cable electrical connector. 4,426,125, Cl. 339-99.00R.

Crawford, Daniel W.: *See*—
Reedy, Robert P.; and Crawford, Daniel W., 4,426,055, Cl. 248-184.000.

Cree, Gavin M.; Wilkins, Terence A.; Monks, Reginald; and Nowotnik, David P., to Amersham International Limited. Derivatives of iodothyronine compounds and their use in an assay for the free iodothyronine compounds. 4,426,453, Cl. 436-500.000.

Cretin, Jacques: *See*—
Beauducel, Claude; and Cretin, Jacques, 4,426,624, Cl. 330-86.000.

Croteau, James; and Enders, John A., to Choice Vend Industries, Inc. Convertible dispensing mechanism for vending machine. 4,426,016, Cl. 221-75.000.

Crow, Vesta J.: *See*—
MacDonald, Christopher N.; and Crow, Vesta J., 4,425,999, Cl. 206-444.000.

Crowe, Curtis W., to Dow Chemical Company, The. Method of acidizing wells using gelled acids. 4,426,296, Cl. 252-8.55C.

Crucible Chemical Company: *See*—
Wilson, Robert B., 4,426,297, Cl. 252-8.600.

Crusher Corporation: *See*—
Morrison, David J., 4,425,797, Cl. 73-379.000.

Csont, Ernest. Apparatus and method for constructing modular concrete shell housing units. 4,426,060, Cl. 249-13.000.

Cukauskas, Edward J., to United States of America, Navy. Method for forming high superconducting T_c niobium nitride film at ambient temperatures. 4,426,268, Cl. 204-192.00C.

Cummins Engine Company, Inc.: *See*—
Shadday, Michael C.; and Wilber, Dennis A., 4,425,879, Cl. 123-41.120.

Cundall, Robert L.; and Walker, Derek, to Bristol-Myers Company. 3-Carbamoyloxy-cepham-4-carboxylic acid derivatives. 4,426,520, Cl. 544-30.000.

Curr, Thomas R.; and Barcza, Nicholas A., to Council for Mineral Technology; and Middleburg Steel and Alloys (Proprietary) Limited. Refining of ferrochromium metal. 4,426,223, Cl. 75-10.00R.

Cutler, Terrill D. Pendulum heimsman seat. 4,425,863, Cl. 114-363.000.

Cutter, James W. X-Ray cassette holder. 4,426,724, Cl. 378-181.000.

Cyronak, Matthew J.; Zanno, Paul R.; and Soukup, Robert J., to General Foods Corporation. Flavoring with ethyl-2-methylthioisobutyrate. 4,426,403, Cl. 426-535.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Hosokawa, Teijiro; Kako, Shigetoshi; and Hagino, Kazuyuki, 4,426,206, Cl. 8-528.000.

Daicel Chemical Industries, Ltd.: *See*—
Omiya, Takeo, 4,426,518, Cl. 536-98.000.

Daiku, Yoshiharu: *See*—
Sugimoto, Hachiro; Nakamura, Takaharu; Hamazo, Sachiyuki; Igarashi, Toshiji; and Daiku, Yoshiharu, 4,426,383, Cl. 424-253.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Sakamoto, Takashi; and Sano, Tetsuo, 4,426,152, Cl. 355-75.000.

Dallavia, Anthony J., Jr.; Van Vleck, Gordon T.; and Traver, Frank J., to General Electric Co. Catalyzing emulsion paper release compositions. 4,426,490, Cl. 524-837.000.

Dana Corporation: *See*—
Antonini, Joseph, 4,426,094, Cl. 277-153.000.
Dick, Wesley M., 4,425,814, Cl. 74-89.150.

Daniels, George R. E., to Dennison Manufacturing Company. Distortion and chemically resistant heat transfer materials. 4,426,422, Cl. 428-352.000.

Datascope Corporation: *See*—
Figuera, Diego, 4,425,670, Cl. 3-1.500.

D'Avello, Robert F.; and Sokola, Raymond L., to Motorola, Inc. Ceramic bandstop filter. 4,426,631, Cl. 333-202.000.

Davis, Lawrence E.; and Patel, Naren I., to Siecor Corporation. Filling materials for communications cable. 4,426,230, Cl. 106-272.000.

Davis, Stephen H., to Water Refining Company. Water softening and treatment system. 4,426,285, Cl. 210-109.000.

Davis, William T., to United States of America, National Aeronautics and Space Administration. Missile rolling tail brake torque system. 4,425,785, Cl. 73-9.000.

Dawson, Terry: *See*—
Donley, Robert; and Dawson, Terry, 4,426,638, Cl. 340-74.000.

Dean, Robert R.; and Mauleon, Jean-Louis. Combined fluid catalytic cracking and hydrocracking process. 4,426,276, Cl. 208-60.000.

de Bruyne, Patrick; Jaecklin, Andre; and Eisele, Dieter, to BBC Brown, Boveri & Company, Limited. Housing for high-power semiconductor components with large diameter intermediate contact disks of differing thicknesses. 4,426,659, Cl. 357-74.000.

Deeken, David G.: *See*—
Richart, Jene A.; Beitler, Bradley D.; and Deeken, David G., 4,426,173, Cl. 405-195.000.

Deere & Company: *See*—
Petrie, Ivan L., 4,425,698, Cl. 29-451.000.

Degoulet, Gabriel: *See*—
Sechet, Claude; Gautier, Christian; and Degoulet, Gabriel, 4,426,684, Cl. 364-900.000.

Deguchi, Yukichi; Miyaji, Shinichiro; and Kobayashi, Hiroaki, to Toray Industries, Inc. Poly-p-phenylene sulfide resin composition and film made thereof. 4,426,479, Cl. 524-430.000.

Degussa AG: *See*—
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,426,532, Cl. 548-344.000.

DelDonno, Theodore A., to Rohm and Haas Company. Polyurethane preparation using organo-zinc catalyst and time-lapse modifier. 4,426,510, Cl. 528-49.000.

Delio, Ralph D.: *See*—
Diemer, Donald J.; and Delio, Ralph D., 4,425,779, Cl. 72-356.000.

Demand, Erhart E., to Temptronic Corporation. Electrical testing system including plastic window test chamber and method of using same. 4,426,619, Cl. 324-73.0PC.

Demco, Inc.: *See*—
Burns, Daniel E., 4,425,768, Cl. 62-237.000.

De Mesmaeker, Ivan: *See*—
Braissant, Pierre; and De Mesmaeker, Ivan, 4,426,671, Cl. 361-82.000.

Dennis, Warren E., to Casablanca Fan Company, Inc.; and Casablanca Fan Company, Inc. Combined shade and socket holder. 4,426,677, Cl. 362-438.000.

Dennison Manufacturing Company: *See*—
Daniels, George R. E., 4,426,422, Cl. 428-352.000.

Dennison National Company: *See*—
Beleckis, Vytautas K.; and Cassidy, Raymond T., 4,426,007, Cl. 211-40.000.

Denoyer, Serge; Guerin, Jacques; Labrot, Maxime; and Serrano, Jean-Pierre, to Commissariat a l'Energie Atomique. Ionized gas generator at very high temperature and very high pressure. 4,426,597, Cl. 313-231.410.

Deposition Technology, Inc.: *See*—
Meckel, Benjamin B.; and Meckel, Nathan K., 4,426,275, Cl. 204-298.000.

Derry, Cecil: *See*—
Preston, Frederick R.; Grosvenor, Ronald L.; and Derry, Cecil, 4,426,015, Cl. 220-403.000.

DeSelms, Roy C.: *See*—
Adin, Anthony; and DeSelms, Roy C., 4,426,441, Cl. 430-351.000.

De Vos, Hendrik A. J.; and Labouliere, Elzear R., to GTE Products Corporation. Lighting fixture connecting device with safety means. 4,426,126, Cl. 339-125.00R.

De Waele, Gerard, to Hanota Holdings S.A. Building block set and method for building with such a block set. 4,425,748, Cl. 52-436.000.

Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Eisenstein, Stephen E., to BASF Wyandotte Corporation. Oxidation stable polyoxyalkylenes containing salts of benzoic acid derivatives. 4,426,300, Cl. 252-8.900.

Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Eisenstein, Stephen E., to BASF Wyandotte Corporation. Polyoxyalkylenes containing alkaline catalyst residues chelated with benzoic acid derivatives. 4,426,301, Cl. 252-8.900.

D'Gerolamo, Frank. Angle indicator attachable to tube benders and the like. 4,425,784, Cl. 72-459.000.

Diagnostic Information, Inc.: *See*—
Wang, Shih-Ping, 4,426,721, Cl. 378-99.000.

Diamond Shamrock Corporation: *See*—
Hardee, Kenneth L.; Gordon, Arnold Z.; Pyle, Charles B.; and Sen, Rajat K., 4,426,263, Cl. 204-101.000.
Rowe, Edward A., Jr., 4,425,949, Cl. 141-1.000.

Dick, Wesley M., to Dana Corporation. Torque limiting device. 4,425,814, Cl. 74-89.150.

Dickinson, Lawrence C. Retractable knife for skiving tool. 4,425,693, Cl. 29-90.00R.

Dickore, Karlfried; and Kuhle, Engelbert, to Bayer Aktiengesellschaft. Preparation of 1-amino-1,3,5-triazine-2,4(1H, 3H)-diones. 4,426,523, Cl. 544-223.000.

Dieckow, Klaus-Peter, to Hammex Machines Ltd. Packaging. 4,426,035, Cl. 206-526.000.

Diehl GmbH & Co.: *See*—
Petersen, Hans; and Stegmann, Kurt, 4,426,697, Cl. 370-85.000.
Petersen, Hans; and Stegmann, Kurt, 4,426,697, Cl. 370-85.000.

Diemer, Donald J.; and Delio, Ralph D. Method of making single or double flanged track tractor roller for off-highway equipment. 4,425,779, Cl. 72-356.000.

Dietze, Wolfgang, to Siemens Aktiengesellschaft. Method of deposition of silicon in fine crystalline form. 4,426,408, Cl. 427-95.000.

Digital Recording Corp.: *See*—
Brenden, Byron B.; and Russell, James T., 4,426,696, Cl. 369-112.000.
Brenden, Byron B.; and Russell, James T., 4,426,696, Cl. 369-112.000.

Dilanni, Elmo J.: *See*—
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DiLorenzo, James V.; Hwang, James C.; Niehaus, William C.; Schlosser, Wolfgang O. W.; and Wemple, Stuart H., to Bell Telephone Laboratories, Incorporated. GaAs FETs Having long-term stability. 4,426,656, Cl. 357-22.000.

Dinter, Peter; and Kolbe, Andreas, to Hoechst Aktiengesellschaft. Coextrusion process and apparatus for manufacturing multi-layered flat films of thermoplastic materials. 4,426,344, Cl. 264-171.000.

Director of the National Institute of Radiological Sciences, Science and Technology Agency, The: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; and Nishikawa, Mineki, 4,426,699, Cl. 371-68.000.

Di Russo, Ettore; Buratti, Massimo; and Veronelli, Silvano, to Alluminio Italia S.p.A. Aluminium alloys composite plates. 4,426,429, Cl. 428-654.000.

Dishner, William C., Jr. Putter. 4,426,083, Cl. 273-164.000.

Disko, Harry: *See*—
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Distler, Walter: *See*—
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Diversey Corporation, The: *See*—
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,426,304, Cl. 252-8.750.

Dison, Lawrence. Automatic resetting target for firearms. 4,426,085, Cl. 273-392.000.

Doemen, Benno; and Muller, Rolf. Direct current fan with control means. 4,426,604, Cl. 318-334.000.

Doi, Atsutoshi: *See*—
Hirao, Motohisa; Doi, Atsutoshi; Nakamura, Michiharu; Tsuji, Shinji; and Mori, Takao, 4,426,700, Cl. 372-45.000.

Dollhausen, Manfred: *See*—
Konig, Eberhard; Hombach, Rudolf; Dollhausen, Manfred; and Pedain, Josef, 4,426,487, Cl. 524-710.000.

Donahue, Joel: *See*—
Chertok, Allan; Donahue, Joel; and Widnall, William, 4,426,192, Cl. 416-1.000.

Donley, Robert; and Dawson, Terry. Flasher for vehicle lights. 4,426,638, Cl. 340-74.000.

Donofrio, David M., to Fermentec Corporation. Fermentation process and apparatus. 4,426,450, Cl. 435-243.000.

Dornberger, Georg C. E.: *See*—
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Dorsch, Norman: *See*—
Sommer, Oswin; Dorsch, Norman; Bosch, Erhard; Schiller, August; and Strasser, Alois, 4,426,474, Cl. 524-243.000.

Dow Chemical Company, The: *See*—
Bice, William L.; Graves, Ernest D., Jr.; and Wagener, Gerald P., 4,425,790, Cl. 73-55.000.
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Gessell, Donald E., 4,426,316, Cl. 502-169.000.
Hanmer, Richard A., 4,426,272, Cl. 204-296.000.
Hefner, Robert E., Jr., 4,426,496, Cl. 525-168.000.
Kosters, Peter H., 4,426,278, Cl. 208-130.000.
Nuckels, Nancy J.; and Thompson, James L., 4,426,303, Cl. 252-8.55D.
Wessling, Ritchie A.; Yats, Larry D.; and Tolbert, Darryl K., 4,426,470, Cl. 524-35.000.
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Draco Laboratories, Inc.: *See*—
Hannas, James R., 4,426,615, Cl. 323-322.000.

Drawert, Friedrich; Schreier, Peter; and Kramer, Gabriele, to Anton Steinecker Maschinenfabrik GmbH. Process for eliminating odor-emitting substances from waste air. 4,426,210, Cl. 55-73.000.

Drent, Eit, to Shell Oil Company. Preparation of carbonate esters in the presence of sulfones. 4,426,331, Cl. 260-463.000.

Dresser Industries, Inc.: *See*—
Adams, George E., III; Bailey, Edwin C.; Klimowicz, Richard F.; and Cope, Geoffrey W., 4,426,012, Cl. 213-135.000.
Garney, Tom A., 4,425,966, Cl. 166-241.000.

Drewett, Glen E.; and Guynes, Kenneth W., to Drewett, Glen E. Easily replaceable shock absorber mount for vessel bumper on a marine structure. 4,426,174, Cl. 405-213.000.

Driz, Dennis E.; and Bremer, Noel J., to Standard Oil Company, The. Process for tableting fine powders. 4,426,342, Cl. 264-109.000.

Drillick, Jacob McP. Traveling pressure pad assembly for mechanical printer apparatus. 4,425,847, Cl. 101-269.000.

Driscoll, Michael E.; and Boozer, Wilson O., III. Masking apron dispensing apparatus. 4,426,245, Cl. 156-511.000.

Dromard, Adrien; and Millet, Claude, to Rhone-Poulenc Specialites Chimiques. Catalytic preparation of high molecular weight polysiloxanes. 4,426,508, Cl. 528-23.000.

Dubost, Gerard; and Vinatier, Claude J., to L'Etat Francais, represente par le Secretaire d'Etat aux Postes et des a la Telediffusion (Centre National d'Etudes des Telecommunications); and Etablissement Public de Diffusion dit "Telediffusion de France". Folded back doublet antenna for very high frequencies and networks of such doublets. 4,426,649, Cl. 343-700.0MS.

Duboz, George: *See*—
Bruni, Maurice; and Duboz, George, 4,426,207, Cl. 44-50.000.

Duesbury, Paul G., to Lucas Industries Limited. Liquid level indicator. 4,425,794, Cl. 73-293.000.

Dunn, Brian T. Slide holder for composite photographs and method of photographing slides. 4,426,000, Cl. 206-455.000.

Dunn, David J.: *See*—
Watson, Colin; and Dunn, David J., 4,426,410, Cl. 427-232.000.

Du Pont de Nemours, E. I., and Company: *See*—
Holtje, Wilfried G., 4,426,231, Cl. 106-288.00Q.
Khan, Ausat A., 4,426,501, Cl. 526-206.000.
Kreuz, John A.; and Hawkins, Christopher M., 4,426,253, Cl. 156-668.000.
Likhyani, Kewal K., 4,426,420, Cl. 428-224.000.
Nair, Kumaran M., 4,426,356, Cl. 419-21.000.
Noyes, Paul R.; and Sommerfeld, Eugene G., 4,426,478, Cl. 524-361.000.
Tobias, Herbert A., 4,425,867, Cl. 118-120.000.

Durant, Graham J.; Ganellin, Charon R.; and Sach, George S., to Smith Kline & French Laboratories Limited. Alkoxypyridyl alkylamines. 4,426,526, Cl. 546-300.000.

Dursch, Walter: *See*—
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Dvorak, Edward E. Ear tag for animals. 4,425,726, Cl. 40-301.000.

Dwyer, Robert M.; and Skiba, Edwin J., to Massey-Ferguson Inc. Tractor draft sensing apparatus. 4,425,970, Cl. 172-7.000.

Dy, Bennett G.: *See*—
Bradford, Robert S.; Brookhart, Marshall R.; and Dy, Bennett G., 4,426,665, Cl. 360-10.200.

Dyer, Curtis A. Automotive vehicle with improved suspension system. 4,426,101, Cl. 280-772.000.

DynaGel, Incorporated: *See*—
Shank, Joseph L., 4,426,443, Cl. 430-538.000.

Dynamit Nobel AG: *See*—
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Dynamit Nobel Aktiengesellschaft: *See*—
Bison, Gunter; Linkat, Norbert; and Wolfes, Wolfgang, 4,426,531, Cl. 548-253.000.

Eardley, David B.: *See*—
Bhatia, Harsaran S.; Eardley, David B.; and Gaur, Santosh P., 4,426,655, Cl. 357-21.000.

Eastman Kodak Company: *See*—
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Bailey, Joseph; Clarke, David; and Johnston, Linda G., 4,426,326, Cl. 260-146.00R.
Barbee, Robert B.; and Wicker, Thomas H., Jr., 4,426,512, Cl. 528-173.000.
Columbus, Richard L., 4,426,451, Cl. 436-518.000.
Good, Raymond H.; and McBride, Paul, 4,426,425, Cl. 428-414.000.
Harasta, Louis P.; Leszyk, Gerald M.; and Morrison, Edward D., 4,426,431, Cl. 430-14.000.

Eaton Corporation: *See*—
Kenny, Andrew A.; and Wojtecki, Ronald J., 4,425,931, Cl. 137-53.000.

Ebi, Yutaka: *See*—
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Ecole Nationale Superieure d'Electricite et de Radioelectricite de Bordeaux (E.N.S.E.R.B.) U.E.R. Derogatoire de l'Universite de Bordeaux: *See*—
Bousseau, Gerard; Baylou, Pierre; Mora, Andre; Monsion, Michel; and Bouvet, Christian, 4,425,751, Cl. 56-327.00A.

Economics Laboratory, Inc.: *See*—
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Edlund, Olof A.; and Enser, Mats A., to International Business Machines Corporation. Character recognition employing compressed image data. 4,426,731, Cl. 382-56.000.

EDS-IDAB, Inc.: *See*—
Kipp, Louis D., 4,425,974, Cl. 177-1.000.

Edwards, Laroy H., to Chevron Research Company. Insecticidal 2-oxo-3-dialkoxyphosphoro-5-cyclopropyl-1,3,4-oxadiazoline. 4,426,379, Cl. 424-200.000.

Edwin Cooper, Inc.: *See*—
Malec, Robert E., 4,426,305, Cl. 252-49.600.

Eeco Incorporated: *See*—
Pargee, Robert W., Jr., 4,426,698, Cl. 371-37.000.

Egami, Tsuneyuki: *See*—
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Egro AG: *See*—
Luthy, Hans; Isler, Eugen; Meier, Ewald; and Zimmermann, Max, 4,425,958, Cl. 164-119.000.

Eida, Tsuyoshi: *See*—
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Eisenstein, Stephen E.: *See*—
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Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Eisenstein, Stephen E., 4,426,301, Cl. 252-8.900.
Electro-Craft Corp.: *See*—
Suita, Muneo; and Mogi, Kazuo, 4,426,606, Cl. 318-375.000.
Electro-Matic Products Co.: *See*—
Armond, Joseph A., 4,426,672, Cl. 361-145.000.
Elert, Karl: *See*—
Cherchian Ara A.; Elert, Karl; and Ast, Gunther E., 4,426,013, Cl. 220-66.000.
Elevitch, Franklin R. Coffee roaster. 4,425,720, Cl. 34-233.000.
Eli Lilly and Company: *See*—
Burchfield, Robert W., 4,426,528, Cl. 548-194.000.
Hsiung, Hansen M., 4,426,517, Cl. 536-27.000.
Robey, Roger L., 4,426,536, Cl. 560-105.000.
Elkuch, Erwin. Apparatus for the conversion of power strokes of a random sequence and of random lengths of strokes into potential energy. 4,426,197, Cl. 417-331.000.
Elliott, Paul G. Street sign adapter unit and street sign assembly including the same. 4,425,728, Cl. 40-607.000.
Ema, Kiichi: *See*—
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Emerson Electric Co.: *See*—
Hierholzer, Frank J., Jr.; and Shelton, Gerald L., 4,426,405, Cl. 427-50.000.
Enders, John A.: *See*—
Croteau, James; and Enders, John A., 4,426,016, Cl. 221-75.000.
Engel, Gerhard; and Wessel, Wolf, to Robert Bosch GmbH. RPM-Governing system for an internal combustion engine with auto-ignition. 4,425,888, Cl. 123-339.000.
Engelhard Corporation: *See*—
Langley, Robert C.; and Myers, Herbert, 4,426,262, Cl. 204-98.000.
Engelke, Helmut: *See*—
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; and Nehmiz, Peter, 4,426,584, Cl. 250-492.200.
Engels, Walter: *See*—
Weissenfels, Franz; and Engels, Walter, 4,426,462, Cl. 521-116.000.
Engineering Resources, Inc.: *See*—
Stavropoulos, Constantine N., 4,426,213, Cl. 55-466.000.
Enser, Mats A.: *See*—
Edlund, Olof A.; and Enser, Mats A., 4,426,731, Cl. 382-56.000.
Ephrath, Linda M., to International Business Machines Corporation. Reactive ion etching apparatus with interlaced perforated anode. 4,426,274, Cl. 204-298.000.
Erlandsen, Peter. Clam dredge. 4,425,723, Cl. 37-55.000.
Ernest, Michael V.; and Maselli, James M., to W. R. Grace & Co. Catalyst composition for exhaust gas treatment. 4,426,320, Cl. 502-313.000.
Ernst, Hermann H. F. Centrifugal fluid seal with drain holes and fluid diverting means. 4,426,088, Cl. 277-14.00R.
Ernst Leitz Wetzlar GmbH: *See*—
Steen, Harald B., 4,426,154, Cl. 356-73.000.
Espelage, Paul M.; Lippitt, David L.; and Tupper, Leland C., to General Electric Company. Twelve pulse load commutated inverter drive system. 4,426,611, Cl. 318-803.000.
ETA S.A., Fabriques d'Ebauches: *See*—
Muller, Jacques; and Mock, Elmar, 4,426,158, Cl. 368-76.000.
Etablissement Dentair Ivoclar: *See*—
Shoher, Itzhak; and Whiteman, Aaron, 4,426,404, Cl. 427-2.000.
Etablissement Public de Diffusion dit "Telediffusion de France": *See*—
Dubost, Gerard; and Vinatier, Claude J., 4,426,649, Cl. 343-700.0MS.
Sechet, Claude; Gautier, Christian; and Degoulet, Gabriel, 4,426,684, Cl. 364-900.000.
Ethicon, Inc.: *See*—
Ivanov, Konstantin, 4,425,915, Cl. 128-325.000.
Ethyl Corporation: *See*—
Perilstein, Warren L., 4,426,208, Cl. 44-56.000.
Eutectic Corporation: *See*—
Kammer, Paul A.; and Gamberg, Edward R., 4,426,428, Cl. 428-561.000.
Evalahti, Osmo: *See*—
Antikainen, Jukka; Evalahti, Osmo; and Waris, Tapio, 4,426,257, Cl. 162-336.000.
Evans, David W.; and Ginsburg, Arthur P., to United States of America, Air Force. Real-time optical filtering method with improved filtered image detection and bandwidth adjustment. 4,426,663, Cl. 358-211.000.
Evans, Deborah A.; and Shelley, Lisbeth E. Cell suspension chamber process. 4,426,295, Cl. 210-772.000.
Ex-Cell-O Corporation: *See*—
Salisbury, Wayne C., 4,426,348, Cl. 264-328.600.
Extra Technical Services: *See*—
Harrison, James M., 4,425,667, Cl. 2-2.000.
Exxon Production Research Co.: *See*—
Richart, Jene A.; Beitler, Bradley D.; and Deeken, David G., 4,426,173, Cl. 405-195.000.
Exxon Research and Engineering Co.: *See*—
Bushnell, James D., 4,426,361, Cl. 422-256.000.
King, Terry S., 4,426,541, Cl. 568-881.000.
Kramer, George M., 4,426,545, Cl. 585-724.000.
McCandlish, Larry E.; and Turaew, Larissa W., 4,426,366, Cl. 423-365.000.
Metrailer, William J., 4,426,277, Cl. 208-127.000.
Peiffer, Dennis G.; Lundberg, Robert D.; and Walker, Thad O., 4,426,473, Cl. 524-111.000.
Wernick, David L.; and Scypinski, Stephen, 4,426,292, Cl. 210-635.000.
Younghouse, Lawrence B., 4,425,907, Cl. 126-439.000.
F. H. Schule GmbH: *See*—
Vick, Walter; and Suhrbier, Rolf, 4,425,841, Cl. 99-605.000.
Fabrig, Paul, to Womako Maschinenkonstruktionen GmbH. Apparatus for winding helical wire coils. 4,425,773, Cl. 72-142.000.
Facet Enterprises, Incorporated: *See*—
Williams, James O., 4,425,812, Cl. 74-6.000.
Fainzilberg, Zeilik, to Wico Corporation. Drop target apparatus. 4,426,081, Cl. 273-127.00D.
Falk, John C., to Borg-Warner Chemicals, Inc. Graft polyblend flow improvers for PVC. 4,426,493, Cl. 525-84.000.
Farnam Companies, Inc.: *See*—
Orlando, Joseph, 4,425,731, Cl. 43-58.000.
Farrar, Gordon A.; and Friemoth, Melvin R., deceased (by Friemoth, Jean M., Executrix), to Owens-Corning Fiberglas Corporation. Electric melting of solidified glass in melting units. 4,426,217, Cl. 65-135.000.
Fatigue Technology, Inc.: *See*—
Champoux, Louis A., 4,425,780, Cl. 72-370.000.
Favennec, Jean-Luc: *See*—
Morin, Francois; Favennec, Jean-Luc; and Bonnel, Madeleine, 4,426,407, Cl. 427-86.000.
Fecske, Aurel J., to Alfa-Laval AB. Mono hydrocyclone separator. 4,426,283, Cl. 209-211.000.
Fegerl, Josef; and Lugscheider, Walter, to Voest-Alpine Aktiengesellschaft. Arrangement for the production of steel. 4,426,709, Cl. 373-22.000.
Fentress, Vernon A., to Raychem Corporation. Heat-recoverable closure assembly. 4,426,413, Cl. 428-36.000.
Fergin, Richard L.: *See*—
Neuzil, Richard W.; and Fergin, Richard L., 4,426,232, Cl. 127-46.300.
Fermentec Corporation: *See*—
Donofrio, David M., 4,426,450, Cl. 435-243.000.
Fernholz, Peter J.: *See*—
Copeland, James L.; Fernholz, Peter J.; Larson, Spencer B.; Salmonson, Duane L.; and Weick, Michael D., 4,426,362, Cl. 422-263.000.
Fetsch, Joseph T., to Hydratron Fuels, Inc. Low density stop float trap. 4,425,933, Cl. 137-172.000.
Ficken, Leonard A.; and Podgorny, Gerald J., to UMC Industries, Inc. Apparatus for dispensing containers from a stack of nested containers. 4,426,017, Cl. 221-222.000.
Figgins, Charles A.: *See*—
Sarkans, Ivars; and Figgins, Charles A., 4,426,242, Cl. 156-252.000.
Figuera, Diego, to Datascope Corporation. Cardiac valvular prosthesis with rheodynamic disc. 4,425,670, Cl. 3-1.500.
Fike, Lester L., Jr., to Fike Metal Products Corporation. Shear type pressure relief device for hydraulic energy absorption unit. 4,426,109, Cl. 293-133.000.
Fike Metal Products Corporation: *See*—
Fike, Lester L., Jr., 4,426,109, Cl. 293-133.000.
Fildan, Gerhard. Separable fastener for garments, belts and the like. 4,425,689, Cl. 24-664.000.
Findl, Eugene: *See*—
Conti, James C.; Strope, Elsine; Findl, Eugene; and Griffiths, Cynthia, 4,425,922, Cl. 128-691.000.
Fine Art Pillow & Specialties Corp.: *See*—
Schutz, Bernard R., 4,426,113, Cl. 297-219.000.
Firey, Joseph C. Further improved engine intake stratifier for continuously variable stratified mixtures. 4,425,892, Cl. 123-430.000.
Fisch, Richard S.; and Mikelsons, Valdis, to Minnesota Mining and Manufacturing Company. Imageable material with radiation absorbing microstructured layers overcoated with photoresist layer. 4,426,437, Cl. 430-166.000.
Fischer, Emil, to Albert Frankenthal AG. Switch for the diversion of spoiled items from an overlapped stream of paper products. 4,426,074, Cl. 271-302.000.
Fischer, Kurt; and Mueller, Franz, to George Fischer Aktiengesellschaft. Metering fuel supply to a sand packing combustion chamber. 4,425,957, Cl. 164-37.000.
Fisler, Charles F., to General Electric Company. Programmable clock radio having nap and sleep type features. 4,426,736, Cl. 455-231.000.
Flanagan, Thomas L., to Standard-Knapp, Inc. Two piece packing case. 4,426,034, Cl. 229-23.0BT.
FMC Corporation: *See*—
Plummer, Ernest L., 4,426,524, Cl. 544-336.000.
Folkmann, Andrew F., to Rockwell International Corporation. Electronically tunable band reject filter. 4,426,630, Cl. 333-174.000.
Forrester, Lester L., to General Dynamics, Pomona Division. Audible test device. 4,426,617, Cl. 324-62.000.
Forster, Denis: *See*—
Barker, George E.; and Forster, Denis, 4,426,542, Cl. 568-883.000.
Forster, Ingrid: *See*—
Bahadir, Mufit; Payer, Wolfgang; Forster, Ingrid; and Lummen, Hans-Albert, 4,426,315, Cl. 502-113.000.
Fournie, Rene; Besnard, Francois; Hons-Olivier, Jacques; and Pierre, Alexandre, to Societe Nationale Elf Aquitaine (Prod.). Annular seal and method of use. 4,426,086, Cl. 277-1.000.
Fouse, Scott D., to Hughes Aircraft Company. Two-dimensional kernel generator for transversal filters. 4,426,629, Cl. 333-165.000.

Fowler, John T., to Laitram Corporation, The. Floating non-gimballed compass. 4,425,716, Cl. 33-355.00R.
FR. Kaiser GmbH: *See*—
Ammon, Helmut K.; and Updike, John G., 4,425,733, Cl. 43-115.000.
Fraenkel, Benjamin S., to Yissum Research Development Co. of the Hebrew University of Jerusalem. Production of monochromatic x-ray images of x-ray sources and space resolving x-ray spectra. 4,426,719, Cl. 378-70.000.
Framatome: *See*—
Chollet, Francis, 4,426,353, Cl. 376-262.000.
Franek, Josef T.; and Porucznik, Paul, to Metal Box Limited. Method and tool for redrawing. 4,425,778, Cl. 72-347.000.
Frank R. Ford Limited: *See*—
Butler, George T., 4,426,044, Cl. 241-236.000.
Franke, Horst; Linder, Ernst; Moser, Winfried; Muller, Klaus; and Rieger, Franz, to Robert Bosch GmbH. Combustion monitoring system for multi-cylinder internal combustion engine. 4,425,788, Cl. 73-35.000.
Franz Buttner AG: *See*—
Hartmann, Heinz, 4,426,169, Cl. 400-241.100.
Fraser, James Y.; and Bailey, Bob, to Racemark International, Inc. Automobile floor mat fastener. 4,425,690, Cl. 24-351.000.
Fraunhofer-Gesellschaft Zur Forderung der Angewandten Forschung e.V.: *See*—
Kiesewetter, Norbert; and Lakatos, Bertalan, 4,425,981, Cl. 181-286.000.
Freelance, Inc.: *See*—
Moustakas, Matthew A.; and Olejkowski, Edwin, 4,425,725, Cl. 40-152.000.
Freeouf, John L.; Kirchner, Peter D.; Pettit, George D.; and Woodall, Jerry M., to International Business Machines Corporation. Volatile metal oxide suppression in molecular beam epitaxy systems. 4,426,237, Cl. 148-175.000.
Freimuth, John H., to Sperry Corporation. Clutch mechanism for baling machine. 4,425,753, Cl. 56-341.000.
Frias, Robert; and Cain, Troy D., to Ingram Corporation. Tubular handling apparatus. 4,426,182, Cl. 414-22.000.
Fricker, Wolfgang-Peter: *See*—
Scholz, Manfred; Fricker, Wolfgang-Peter; and Gollasch, Bernd, 4,425,963, Cl. 165-104.320.
Friedel, Rudolf, to Siemens Aktiengesellschaft. Drive for rotary anodes of X-ray tubes. 4,426,720, Cl. 378-93.000.
Friemoth, Jean M., Executrix: *See*—
Farrar, Gordon A.; and Friemoth, Melvin R., deceased, 4,426,217, Cl. 65-135.000.
Friemoth, Melvin R., deceased: *See*—
Farrar, Gordon A.; and Friemoth, Melvin R., deceased, 4,426,217, Cl. 65-135.000.
Fries, Richard W.; and Buehler, Charles K., to Northern Petrochemical Company. Supported polyethylene polymerization catalysts utilizing substituted polystyrene resins. 4,426,318, Cl. 502-154.000.
Fritzenwenger, Josef A.; Probst, Martin; and Schmid, Gunther, to Bayerische Motoren Werke Aktiengesellschaft. Cooling arrangement for liquid cooled internal combustion engines. 4,425,877, Cl. 123-41.100.
Fuchs, Francis J., Jr., to Western Electric Co. Methods for extrusion. 4,425,775, Cl. 72-270.000.
Fudickar, Carl S.; and Thies, Peter, to C. S. Fudickar K.G. PTC Heating element. 4,426,573, Cl. 219-544.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Makita, Fujio, 4,425,992, Cl. 192-82.00T.
Fuji Photo Film, Co., Ltd.: *See*—
Minamizono, Junji; Hirano, Mitunori; Kawashima, Yoshiro; and Ogawa, Tadashi, 4,426,445, Cl. 430-599.000.
Fujimura, Osamu, to Bell Telephone Laboratories, Incorporated. X-Ray microbeam generator. 4,426,722, Cl. 378-137.000.
Fujirebio Kabushiki Kaisha: *See*—
Aoki, Tadao; Miyakoshi, Hideo; and Mizukoshi, Mikio, 4,426,454, Cl. 436-504.000.
Fujisaki, Iwao; Kosuge, Shuichi; Ogawa, Syuu; Sato, Kimihiko; and Soeda, Toshimi, to Senoh Kabushiki Kaisha. Apparatus for checking pulse and heart rates. 4,425,921, Cl. 128-690.000.
Fujitsu Fanuc Limited: *See*—
Imazeki, Ryoji; Yamazaki, Etsuo; and Matsuura, Hitoshi, 4,426,180, Cl. 409-99.000.
Kawada, Shigeki; and Kobari, Katsuo, 4,426,610, Cl. 318-798.000.
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Abiru, Akira; Sugimoto, Masahiro; and Inomata, Juro, 4,426,657, Cl. 357-29.000.
Kawaura, Kuninori; Yamada, Sumio; Wakatsuki, Noboru; Ono, Masaaki; Tanji, Shigeo; Fujiwara, Yoshiro; and Yanagisawa, Masanobu, 4,426,595, Cl. 310-313.00D.
Kobayashi, Koichi; Kawashima, Kenichi; and Oshio, Shuzo, 4,426,439, Cl. 430-269.000.
Sasaki, Nobuo; and Nakano, Motoo, 4,425,700, Cl. 29-571.000.
Shimizu, Kazuyuki; and Koshino, Minoru, 4,426,713, Cl. 375-106.000.
Yamaguchi, Hisashi; Kawada, Toyoshi; Kashiwara, Hirofumi; Ishizaki, Hiroyuki; and Murase, Kenji, 4,426,646, Cl. 340-769.000.
Yamamoto, Tsuyoshi; and Takahashi, Hitoshi, 4,426,686, Cl. 365-104.000.
Fujiwara, Yoshiro: *See*—
Kawaura, Kuninori; Yamada, Sumio; Wakatsuki, Noboru; Ono, Masaaki; Tanji, Shigeo; Fujiwara, Yoshiro; and Yanagisawa, Masanobu, 4,426,595, Cl. 310-313.00D.
Fukagawa, Yasuo: *See*—
Okabe, Mitsuyasu; Yoshioka, Takeo; Fukagawa, Yasuo; Okamoto, Rokuro; Kouno, Kageaki; and Ishikura, Tomoyuki, 4,426,390, Cl. 424-274.000.
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Fukuda, Hiroshi: *See*—
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Fukumi, Hiroshi: *See*—
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Fukumitsu, Akira: *See*—
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Fukuoka, Tatsuhiko: *See*—
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Fukushima, Toshihiko; Miyamoto, Seigo; Kawashima, Kenichi; Kawabata, Toshiaki; Tani, Seijiro; and Shibata, Takanori, to Hitachi, Ltd. Air conditioner for automobiles. 4,425,765, Cl. 62-133.000.
Funada, Fumiaki; Minezaki, Shigehiro; Kozaki, Syuichi; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Twisted nematic liquid crystal display panel. 4,426,133, Cl. 350-334.000.
Furia, Edoardo: *See*—
Vittone, Andrea; and Furia, Edoardo, 4,426,343, Cl. 264-147.000.
Furusawa, Morimasa: *See*—
Minegishi, Sokichi; Takizawa, Tozo; and Furusawa, Morimasa, 4,425,692, Cl. 29-611.000.
Furuta, Yoichi, to Aisin Seiki Company, Limited. Brake booster with reaction disc plate and cylindrical member. 4,425,760, Cl. 60-547.100.
Fushihara, Tomotsuru. Method for separating drinking water. 4,426,261, Cl. 204-98.000.
Gabriel, Frank K.; and North, William E., to Westinghouse Electric Corp. Turbine disc cavity temperature sensing arrangement. 4,426,161, Cl. 374-144.000.
Gagliani, John; and Long, John V. Modified polyimide foams and methods of making same. 4,426,463, Cl. 521-180.000.
Galwey, Ronald K.; and Kanazawa, Kay K., to International Business Machines Corporation. Detection circuitry for electrochemical analysis. 4,426,621, Cl. 324-439.000.
Gamberg, Edward R.: *See*—
Kammer, Paul A.; and Gamberg, Edward R., 4,426,428, Cl. 428-561.000.
Gancy, Alan B. Process of making calcium acetate deicing agents. 4,426,308, Cl. 252-70.000.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Sach, George S., 4,426,526, Cl. 546-300.000.
Garagnani, Enea: *See*—
Marzola, Roberto; Garagnani, Enea; and Moro, Alessandro, 4,426,469, Cl. 523-209.000.
Garbell, Maurice A. Sliding panel with sound-trap framing. 4,425,739, Cl. 49-424.000.
Garceau, Ronald; and Ramsey, Henry R., to Webster Spring Co., Inc. Coil spring assembly with grid and base frame. 4,426,070, Cl. 267-91.000.
Gardner, Hugh C., to Union Carbide Corporation. Curable physical mixtures and composites therefrom. 4,426,491, Cl. 524-878.000.
Garney, Tom A., to Dresser Industries, Inc. Borehole centralizer with positively indexable contact arms. 4,425,966, Cl. 166-241.000.
Garrett Corporation, The: *See*—
McJones, Robert W.; McCarty, Robert S.; and Cardillo, Joseph S., 4,425,893, Cl. 123-446.000.
Garrett, Harrison: *See*—
Willis, Albert E.; Gould, John M.; Matheney, Jack L.; and Garrett, Harrison, 4,426,678, Cl. 363-25.000.
Gartside, Robert J.: *See*—
Woebcke, Herman N.; Bhojwani, Arju H.; and Gartside, Robert J., 4,426,359, Cl. 422-145.000.
Gaspar, Richard A.: *See*—
Cole, Robert C.; Gaspar, Richard A.; Stackhouse, Donald C.; and Trentman, John L., 4,426,072, Cl. 270-53.000.
Gaur, Santosh P.: *See*—
Bhatia, Harsaran S.; Eardley, David B.; and Gaur, Santosh P., 4,426,655, Cl. 357-21.000.
Gauthier-Lafaye, Jean; and Perron, Robert, to Rhone-Poulenc Industries. Preparation of carboxylic acids by carbonylation of alcohols. 4,426,537, Cl. 562-519.000.
Gautier, Christian: *See*—
Sechet, Claude; Gautier, Christian; and Degoulet, Gabriel, 4,426,684, Cl. 364-900.000.
Gaz de France: *See*—
Thouault, Alain; Chapuis, Claude; and Austruy, Georges, 4,425,902, Cl. 126-360.00R.
Gebert, Kenneth W.; and Rajski, Pat A., to Consolidated Papers, Inc. Edge dam for paper coating apparatus and method. 4,426,412, Cl. 427-356.000.
Geddes, Leslie A.: *See*—
Bourland, Joe D.; Geddes, Leslie A.; Babbs, Charles F.; and Tacker, Willis A., Jr., 4,425,920, Cl. 128-672.000.
Geigert, John; and Neidleman, Saul L., to Cetus Corporation. Method for producing vicinal dihalogented products. 4,426,449, Cl. 435-155.000.
Geisel, Anthony; and Rohowsky, Bohdan. Ladder platform. 4,425,985, Cl. 182-121.000.

Gelardi, Anthony L.; Gelardi, Paul J.; and MacLeod, Robert B., Jr., to Shape Inc. Plate bracket for mounting a cassette box. 4,426,056, Cl. 248-225.100.

Gelardi, Paul J.: *See*—
Gelardi, Anthony L.; Gelardi, Paul J.; and MacLeod, Robert B., Jr., 4,426,056, Cl. 248-225.100.

General Dynamics, Pomona Division: *See*—
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General Electric Company: *See*—
Brenig, Theodore, 4,426,733, Cl. 455-79.000.
Dallavia, Anthony J., Jr.; Van Vleck, Gordon T.; and Traver, Frank J., 4,426,490, Cl. 524-837.000.
Espelage, Paul M.; Lippitt, David L.; and Tupper, Leland C., 4,426,611, Cl. 318-803.000.
Fisler, Charles F., 4,426,736, Cl. 455-231.000.
Mark, Victor, 4,426,513, Cl. 528-204.000.
Steigerwald, Robert L.; Kornrumpf, William P.; and Walden, John P., 4,426,564, Cl. 219-10.770.
Taylor, Carl D., 4,426,676, Cl. 362-371.000.
Underkoffler, Edwin C., 4,426,555, Cl. 179-84.00L.

General Foods Corporation: *See*—
Cyronak, Matthew J.; Zanno, Paul R.; and Soukup, Robert J., 4,426,403, Cl. 426-535.000.
Jacobsen, David T.; and Klopfenstein, Jerome P., 4,425,843, Cl. 100-229.00A.

General Motors Corporation: *See*—
Claypole, George M., 4,425,766, Cl. 62-133.000.
Livesay, J. D., 4,425,837, Cl. 92-71.000.

General Tire & Rubber Company, The: *See*—
Vitus, Francis J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,426,495, Cl. 525-92.000.

George Fischer Aktiengesellschaft: *See*—
Fischer, Kurt; and Mueller, Franz, 4,425,957, Cl. 164-37.000.

George Fischer Ltd.: *See*—
Wuchner, Xaver, 4,426,178, Cl. 408-28.000.

Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH: *See*—
Schwenke, Joachim; Knoth, Joachim; Marten, Rainer; and Rosomm, Herbert, 4,426,717, Cl. 378-45.000.

Gesellschaft Fur Strahlen-und Umweltforschung mbH: *See*—
Kreiner, Hans-Jurg; Seif, Rudolf; and Zimmer, Wilhelm, 4,426,581, Cl. 250-380.000.

Gessell, Donald E., to Dow Chemical Company, The. Catalyst prepared from organomagnesium compound, organic hydroxyl-containing compound, reducing halide source and transition metal compound. 4,426,316, Cl. 502-169.000.

Gestetner Manufacturing Limited: *See*—
Kuemmel, Klaus; Klapettek, Gerhard; and Schneider, Siegfried, 4,426,149, Cl. 355-8.000.

Gibson, James F., to Lockheed Corporation. Door locking mechanism. 4,426,107, Cl. 292-201.000.

Gifford, Richard L., to Brunswick Corporation. Bail trip mechanism for fishing reel. 4,426,045, Cl. 242-84.20G.

Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; Shrive, Nigel G.; and Raymont, Michael E. D., to Sulphur Development Institute of Canada (SUDIC). Freeze/thaw durable sulphur compositions. 4,426,456, Cl. 501-84.000.

Gimond, Jacques; Gonda, Richard; Hicter, Jean-Marie; and Laty, Pierre, to Societe de Vente de l'Aluminium Pechiney. Rotary gas dispersion device for the treatment of a bath of liquid metal. 4,426,068, Cl. 266-217.000.

Ginsburg, Arthur P.: *See*—
Evans, David W.; and Ginsburg, Arthur P., 4,426,663, Cl. 358-211.000.

Gipson, Robert M.: *See*—
McCoy, David R.; Gipson, Robert M.; and Naylor, Carter G., 4,426,302, Cl. 252-8.55D.

Givaudan Corporation: *See*—
Ochsner, Paul A., 4,426,321, Cl. 252-522.00R.

Globe Rubber Works, Inc.: *See*—
Somerville, Richard C., 4,425,694, Cl. 29-110.000.

Goetz, Edward E., Jr. Hydrodynamic fishing lure. 4,425,730, Cl. 43-42.110.

Golden, Frederick L. Edge connected three dimensional structures. 4,425,740, Cl. 52-81.000.

Gollasch, Bernd: *See*—
Scholz, Manfred; Fricker, Wolfgang-Peter; and Gollasch, Bernd, 4,425,963, Cl. 165-104.320.

Goller, Glen J.; Breault, Richard D.; and Smith, J. Harold, to United Technologies Corporation. Process for fabricating ribbed electrode substrates and other articles. 4,426,340, Cl. 264-29.100.

Gonda, Richard: *See*—
Gimond, Jacques; Gonda, Richard; Hicter, Jean-Marie; and Laty, Pierre, 4,426,068, Cl. 266-217.000.

Gontowski, Walter S., Jr., to Sprague Electric Company. IC With protection against reversed power supply. 4,426,658, Cl. 357-48.000.

Gonzalez, Teodoro J., to Price Pfister, Inc. Snap in valve cartridge for plumbing fixture. 4,425,935, Cl. 137-315.000.

Good, Raymond H.; and McBride, Paul, to Eastman Kodak Company. Novel polyamine compounds and their use as curing agents for epoxy resins. 4,426,425, Cl. 428-414.000.

Gopher Shooter's Supply Company, Incorporated: *See*—
Purdie, Clarence E., deceased, 4,425,833, Cl. 86-44.000.

Gordon, Arnold Z.: *See*—
Hardee, Kenneth L.; Gordon, Arnold Z.; Pyle, Charles B.; and Sen, Rajat K., 4,426,263, Cl. 204-101.000.

Gordon, Marvin; and Lichtenstein, Joseph, to Whitman Medical Corporation. Incentive spirometer with automatic levelling. 4,425,923, Cl. 28-727.000.

Gorski-Popiel, George, to Massachusetts Institute of Technology. Correlation system for global position receiver. 4,426,712, Cl. 375-96.000.

Goss, David C., to Thermon Manufacturing Company. Concentric tube heat tracing apparatus. 4,425,936, Cl. 137-340.000.

Goss, Gary J.: *See*—
Yu, Kin C.; and Goss, Gary J., 4,426,679, Cl. 364-200.000.

Goto, Satoshi: *See*—
Sawada, Kiyoshi; Goto, Satoshi; Sasaki, Osamu; Takahashi, Jiro; and Komamura, Tawara, 4,426,432, Cl. 430-58.000.

Goto, Takahiro: *See*—
Manabe, Nobuyuki; and Goto, Takahiro, 4,426,233, Cl. 134-21.000.

Gotoda, Yusuke, to Honda, Gikes, Kogyo, Kabushiki, Kaisha. Power transmission system for vehicles. 4,425,989, Cl. 192-48.920.

Goudie, Alexander C., to Beecham Group Limited. Chemical compounds. 4,426,392, Cl. 424-308.000.

Gould Inc.: *See*—
Halasz, Laszlo, 4,426,031, Cl. 228-121.000.

Gould, John M.: *See*—
Willis, Albert E.; Gould, John M.; Matheney, Jack L.; and Garrett, Harrison, 4,426,678, Cl. 363-25.000.

Government Innovators, Inc.: *See*—
Pickrell, John W., 4,425,836, Cl. 91-405.000.

Gowan, John G., to United States of America, Air Force. Replaceable diffraction gratings for cooled laser optics. 4,426,131, Cl. 350-162.200.

Gozzo, Franco: *See*—
Troiani, Nicola; Gozzo, Franco; and Lorusso, Simone, 4,426,393, Cl. 424-327.000.

Graber Industries, Inc.: *See*—
Kaucic, Edward M., 4,425,955, Cl. 160-168.00R.
Terlecke, Mark J., 4,425,956, Cl. 160-168.00R.

Graco Inc.: *See*—
Kwok, Kui C., 4,426,039, Cl. 239-415.000.

Grady, John K. Biplanar variable angle X-ray examining apparatus. 4,426,725, Cl. 378-196.000.

Grant, Robert F. Article display and holder apparatus. 4,425,997, Cl. 206-0.840.

Grassmann, Peter: *See*—
Baer, Ulrich; Distler, Walter; and Grassmann, Peter, 4,426,715, Cl. 378-4.000.

Gratz, Johannes; and Kerstges, Ferdinand, to Steag Aktiengesellschaft. Outer wall suspended in front of a metal structure. 4,425,745, Cl. 52-235.000.

Graves, Ernest D., Jr.: *See*—
Bice, William L.; Graves, Ernest D., Jr.; and Wagener, Gerald P., 4,425,790, Cl. 73-55.000.

Graves, Toby R.: *See*—
Woods, John H.; Laughlin, Charles E.; and Graves, Toby R., 4,426,329, Cl. 260-398.600.

Greenberger, Joseph I.; and Kohring, Frederick C., to Wean United, Inc. Liquid discharge apparatus. 4,425,928, Cl. 134-122.00R.

Greiner, Leonard. Chemical heat pump. 4,425,903, Cl. 126-419.000.

Grendol, Clark L.; and Seager, Richard H., to American Optical Corporation. Safety goggle. 4,425,669, Cl. 2-436.000.

Greschner, Johann: *See*—
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; and Nehmiz, Peter, 4,426,584, Cl. 250-492.200.

Griesser, Walter, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Clutch assembly for gear transmission. 4,425,990, Cl. 192-53.00G.

Griffiths, Cynthia: *See*—
Conti, James C.; Strope, Elaine; Findl, Eugene; and Griffiths, Cynthia, 4,425,922, Cl. 128-691.000.

Grimm, Hans: *See*—
Horner, Ernst L.; Knolle, Jurgen C.; and Grimm, Hans, 4,425,865, Cl. 118-19.000.

Gritton, Charles W. K., to Bell Telephone Laboratories, Incorporated. Partial band - whole band energy discriminator. 4,426,729, Cl. 381-41.000.

Grogan, Hope: *See*—
Grogan, Victor A., 4,426,563, Cl. 200-334.000.

Grogan, Victor A., to Grogan, Victor A.; Grogan, Hope; and Wessendorf, Walter F., Jr. Chain saw safety switch. 4,426,563, Cl. 200-334.000.

Gross, Nelson B.: *See*—
Johnson, Walter T.; and Gross, Nelson B., 4,426,120, Cl. 312-100.000.

Gross, Sol A. Collapsible luggage carrier. 4,426,099, Cl. 280-655.000.

Grossler, Peter, to Messerschmitt-Bolkow-Blohm G.m.b.H. Device for initiating an explosive charge with damming means of non-explosive shock wave attenuating material between the outer booster and the liner. 4,425,850, Cl. 102-307.000.

Grosvenor, Ronald L.: *See*—
Preston, Frederick R.; Grosvenor, Ronald L.; and Derry, Cecil, 4,426,015, Cl. 220-403.000.

Grove Valve and Regulator Company: *See*—
Van Scoy, Davis A., 4,425,806, Cl. 73-861.610.

Gruber, Robert J.: *See*—
Lewis, Richard B.; Julien, Paul C.; Gruber, Robert J.; and Koehler, Richard F., Jr., 4,426,436, Cl. 430-137.000.

Grunzweig & Hartmann Montage GmbH: *See*—
Scholz, Manfred; Fricker, Wolfgang-Peter; and Gollasch, Bernd, 4,425,963, Cl. 165-104.320.

GTE Laboratories: *See—*
Sarin, Vinod K.; and Buljan, Sergej-Tomislav, 4,426,209, Cl. 51-295.000.
GTE Products Corporation: *See—*
Chenot, Charles F.; and Walter, Wolfgang, 4,426,600, Cl. 313-487.000.
De Vos, Hendrik A. J.; and Labouliere, Elzear R., 4,426,126, Cl. 339-125.00R.
Mizuhara, Howard, 4,426,033, Cl. 228-56.000.
Guerin, Jacques: *See—*
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Gugliotti, Carmelo L., to Turrissi, Andrew. Electric hair curling iron. 4,426,567, Cl. 219-225.000.
Guynes, Kenneth W.: *See—*
Drewett, Glen E.; and Guynes, Kenneth W., 4,426,174, Cl. 405-213.000.
Guziec, Frank S., Jr., to Thiokol Corporation. Method for producing aldehydes and ketones using 2,2'-bipyridinium chlorochromate as oxidizing agent. 4,426,534, Cl. 549-70.000.
Hachitani, Shuji; Tanaka, Yasushi; Ogino, Haruhiko; and Nakamura, Tetsuya, to Nippondenso Co., Ltd. Electric governor for internal combustion engine. 4,425,889, Cl. 123-357.000.
Hacksell, Uli A.: *See—*
Arvidsson, Folke L.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Lindberg, Per. L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Nils U. E.; and Wikstrom, Hakan V., 4,426,386, Cl. 424-267.000.
Hackstein, Karl-Gerhard; Hrovat, Milan; Huschka, Hans; and Koch, Karl-Heinz, to Nukem GmbH. Process for the production of U_3O_8 sintered bodies. 4,426,338, Cl. 264-0.500.
Hage, Manfred; and Schinkoth, Gerhard, to Wieland-Werke A.G. Finned tube for a heat exchanger. 4,425,942, Cl. 138-38.000.
Hagino, Kazuyuki: *See—*
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Hakoune, Maurice. Method for treating a gem and gem treated with this method. 4,425,769, Cl. 63-32.000.
Halasz, Laszlo, to Gould Inc. Method of soldering ink jet nozzle to piezoelectric element. 4,426,031, Cl. 228-121.000.
Hall, Wilbur L.: *See—*
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Halogen Insulator & Seal Corp.: *See—*
Bender, Michael J., 4,426,090, Cl. 277-27.000.
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Sugimoto, Hachiro; Nakamura, Takaharu; Hamazo, Sachiyuki; Igarashi, Toshiji; and Daiku, Yoshiharu, 4,426,383, Cl. 424-253.000.
Hamilton, Carl C.: *See—*
Porta, Livio D.; Berkowitz, David A.; Withuhn, William L.; and Hamilton, Carl C., 4,425,763, Cl. 60-693.000.
Hammerschmidt, Erich; Behre, Horst; Kruger, Bruno; and Winkler, Adolf, to Bayer Aktiengesellschaft. Process for the preparation of 1-benzoylamino-8-hydroxynaphthalene-4,6-disulphonic acid (benzoyl-K acid). 4,426,333, Cl. 260-507.00R.
Hammex Machines Ltd.: *See—*
Dieckow, Klaus-Peter, 4,426,035, Cl. 206-526.000.
Hamprecht, Berhard; and Wuerzer, Bruno, to BASF Aktiengesellschaft. 2H-1,2,4,6-Thiatriazine-1-dioxides and their use for controlling undesirable plant growth. 4,426,219, Cl. 71-91.000.
Hamprecht, Gerhard: *See—*
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Hanmer, Richard A., to Dow Chemical Company, The. Electrolytic cell vermiculite diaphragms. 4,426,272, Cl. 204-296.000.
Hannas, James R., to Draco Laboratories, Inc. Solid state electronic power switch. 4,426,615, Cl. 323-322.000.
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Haraguchi, Kazuo: *See—*
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Haranta, Louis P.; Leszyk, Gerald M.; and Morrison, Edward D., to Eastman Kodak Company. Radiation-curable compositions for restorative and/or protective treatment of photographic elements. 4,426,431, Cl. 430-14.000.
Harato, Takuo: *See—*
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Hardee, Kenneth L.; Gordon, Arnold Z.; Pyle, Charles B.; and Sen, Rajat K., to Diamond Shamrock Corporation. Method and electrocatalyst for making chlorine dioxide. 4,426,263, Cl. 204-101.000.
Hargett, Francis B., to AMF Incorporated. Means for processing sheets of material. 4,425,858, Cl. 112-121.120.
Hargis, Ivan G.: *See—*
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Harigae, Shunji: *See—*
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Harned, Dan B.: *See—*
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Harold Sponseller and Associates, Inc.: *See—*
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Harper, Oris E., to Rampon Products, Inc. Knee protector/stabilizer. 4,425,912, Cl. 128-80.00C.
Harris Corporation: *See—*
Cole, Robert C.; Gaspar, Richard A.; Stackhouse, Donald C.; and Trentman, John L., 4,426,072, Cl. 270-53.000.
Riffe, Josephus; and Sinha, Rajiv, 4,426,682, Cl. 364-200.000.
Harrison, James M., to Extra Technical Services. Protective vest apparatus. 4,425,667, Cl. 2-2.000.
Harrison Mayer Limited: *See—*
Keeling, Robert A.; and Hunt, John, 4,426,227, Cl. 106-27.000.
Harry, Ieuan L.: *See—*
Krishnakumar, Suppayan M.; Pocock, John F. E.; and Harry, Ieuan L., 4,426,202, Cl. 425-534.000.
Hart, Walter D.: *See—*
Meyers, Robert A.; and Hart, Walter D., 4,426,281, Cl. 209-11.000.
Harteck, Paul, to Rensselaer Polytechnic Institute. Fixation of nitrogen in the presence of water vapor. 4,426,367, Cl. 423-395.000.
Hartmann, Heinz, to Franz Buttner AG. Typewriting ribbon with adhesively correctable print. 4,426,169, Cl. 400-241.100.
Hartmann, Kurt: *See—*
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Harvey, Kenneth: *See—*
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Harwood, Leopold A.; and Shanley, Robert L., II, to RCA Corporation. Circuit for linearly gain controlling a differential amplifier. 4,426,625, Cl. 330-254.000.
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Hashimoto, Seiichi; and Aoki, Takaaki. Clamp for hoses and the like. 4,425,682, Cl. 24-20.00S.
Hashiya, Minoru, to Shinano Kikaku Co., Ltd. Lens attchment for forming wide-ranging images. 4,426,135, Cl. 350-422.000.
Hata, Masahiko, to Yoshida Kogyo K. K. Separable slide fastener. 4,425,683, Cl. 24-381.000.
Hataoka, Nobuo: *See—*
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Haupt, Heinrich: *See—*
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Hawker Siddeley Dynamics Engineering Limited: *See—*
Turton, David; and Thompson, Lionel R. F., 4,425,793, Cl. 73-290.00R.
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Hayama, Nobuhiro: *See—*
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Hayashi, Makoto; Sakata, Shinji; and Shimizu, Tasuku, to Hitachi, Ltd. X-Ray diffraction apparatus. 4,426,718, Cl. 378-072.000.
Haynes, Harold R.: *See—*
Poffenbarger, Perry S., 4,426,642, Cl. 340-690.000.
Hays, Bill J. Automotive clutch improvements. 4,425,991, Cl. 192-70.270.
Hazelrigg, Keith R., to NL Industries, Inc. Underwater connector apparatus. 4,426,104, Cl. 285-26.000.
Healy, James W., to Superwinch, Inc. Winch drive mechanism. 4,426,064, Cl. 254-342.000.
Hechtl, Wolfgang: *See—*
Louis, Eckhart; Aigner, Ernst; and Hechtl, Wolfgang, 4,426,240, Cl. 156-99.000.
Hefner, Robert E., Jr., to Dow Chemical Company, The. Poly(allyl)-poly(alkenylphenol) polymer compositions. 4,426,496, Cl. 525-168.000.
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Helene Curtis Industries, Inc.: *See*—
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Helling, Gunter, to Agfa-Gevaert Aktiengesellschaft. Anionic copolymers containing polyvalent metal cations and their use in photographic materials. 4,426,438, Cl. 430-213.000.
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Hese, Nils; Seeling, Alfred; and Weisweiler, Manfred, to Carl Schleicher & Schull GmbH & Co. KG. Process for the marking of carrierless polymeric membranes and asymmetric carrierless polymeric membrane. 4,426,204, Cl. 8-492.000.
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Heuckelbach, Frederik E.; Weber, Robert; and Weber, Jakob, to Kraftwerk Union Aktiengesellschaft. Repair plug for heat exchanger tubes, especially for steam generators of pressurized-weather nuclear power plants. 4,425,944, Cl. 138-89.000.
Heuckroth, Carl C. Wire drive system. 4,426,046, Cl. 242-181.000.
Heymes, Rene: *See*—
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Heyn, Klaus; and Pogrzeba, Hans J., to Steag Aktiengesellschaft. Installation for recovering energy from solid fossil fuels, more particularly bituminous coal high in inerts. 4,425,757, Cl. 60-39.182.
Heywood, Joseph R.; and Ainsworth, Leonard H. Improvements to poker machines-simulated handle action. 4,426,082, Cl. 273-143.00R.
Hicter, Jean-Marie: *See*—
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Hierholzer, Frank J., Jr.; and Shelton, Gerald L., to Emerson Electric Co. Method for producing improved silicon carbide resistance elements. 4,426,405, Cl. 427-50.000.
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Hikino, Tadashi; Kobayashi, Ikuo; and Nagai, Takeshi, to Matsushita Electric Industrial Co., Ltd. Infrared radiative body and a method for making the same. 4,426,570, Cl. 219-354.000.
Hildebrand, Karl. Ball and socket joint for dumper trucks. 4,426,172, Cl. 403-122.000.
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Hirata, Atsumi, to Victor Company of Japan, Ltd.; and Victor Company of Japan, Ltd. Rotary recording medium having an improved three frequency pickup tracking control and reproducing apparatus therefor. 4,426,692, Cl. 369-32.000.
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Hirao, Motohisa; Doi, Atsutoshi; Nakamura, Michiharu; Tsuji, Shinji; and Mori, Takao, 4,426,700, Cl. 372-45.000.
Kashimura, Yuichi; Suda, Seiji; and Sugiura, Noboru, 4,425,891, Cl. 123-425.000.
Komatsu, Akio; Ichikawa, Akira; Hataoka, Nobuo; Kitazume, Yoshiaki; and Umemura, Kazuhiro, 4,426,551, Cl. 381-41.000.
Kurihara, Nobuo; Morooka, Yasuo; Nishikawa, Mitsuyo; Miura, Kiyoshi; and Nagahashi, Yoshitoshi, 4,426,641, Cl. 340-683.000.
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Oritsuki, Ryoji; Watanabe, Tohru; Shirahashi, Kazuo; Kansi, Hiromi; and Odawara, Kozo, 4,426,548, Cl. 174-72.00R.
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Hobourn-Eaton Limited: *See*—
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Hoechst Aktiengesellschaft: *See*—
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Wissmann, Hans; and Kleiner, Hans-Jerg, 4,426,325, Cl. 260-112.50R.
Hoekstra, Edith, executrix: *See*—
Hoekstra, Gerald B., deceased, 4,425,967, Cl. 166-259.000.
Hoekstra, Gerald B., deceased (by Hoekstra, Edith, executrix), to Standard Oil Company (Indiana). Ignition procedure and process for in situ retorting of oil shale. 4,425,967, Cl. 166-259.000.
Hof, Craig R.; and Shah, Hasmukh, to PyMaH Corporation. Protective packaging for thermolabile goods using compounds with melting points slightly below thermosensitive temperature of the goods. 4,425,998, Cl. 206-306.000.
Hoffman, Stephen A.: *See*—
Coughlin, William J.; Rieppel, Perry J.; and Hoffman, Stephen A., 4,426,566, Cl. 219-137.410.
Hoffmann, Johann, to Texas Instruments Deutschland GmbH. Apparatus for transporting workpieces through a processing system. 4,425,996, Cl. 198-653.000.
Hoffmann-La Roche Inc.: *See*—
Meienhofer, Johannes A., 4,426,324, Cl. 260-112.50R.
Thomson, David M. P., 4,426,446, Cl. 435-7.000.
Hoffmann, Werner: *See*—
Thoemel, Frank; and Hoffmann, Werner, 4,426,332, Cl. 260-465.00F.
Hoffmann, Wolfgang, to B & H Manufacturing Company, Inc. Machine and method for coating plastic containers. 4,425,866, Cl. 118-58.000.
Hogan, Lawrence R.; and Anderson, Lenart, to Baxter Travenol Laboratories, Inc. Device for dispensing fluid. 4,426,024, Cl. 222-173.000.
Hohn, Fritz-Jurgen: *See*—
Chang, Tai-Hon P.; Coane, Phillip J.; Hohn, Fritz-Jurgen; and Kern, Dieter P., 4,426,583, Cl. 250-398.000.
Hokuetsu Industries Co., Ltd.: *See*—
Mizuno, Masamitsu; Itoh, Kazuomi; and Urushibara, Masahiro, 4,426,613, Cl. 322-21.000.
Holaday, John W., to United States of America, Army. Thyrotropin releasing hormone in therapy of shock and as a central nervous system stimulant. 4,426,378, Cl. 424-177.000.
Holcomb, Harry F. Bright ring keratoscope. 4,426,141, Cl. 351-212.000.
Hollins, Richard A.: *See*—
Atkins, Ronald L.; Norris, William P.; Nielsen, Arnold T.; Hollins, Richard A.; and Wilson, William S., 4,426,539, Cl. 564-441.000.
Hollis, Terence: *See*—
Thring, Robert H.; and Hollis, Terence, 4,425,884, Cl. 123-272.000.

Holte, Hans. Displaceable, electric distribution device for building sites or similar. 4,426,674, Cl. 361-384.000.
Holtje, Wilfried G., to Du Pont de Nemours, E. I., and Company. Light stable quinacridonequinone pigments. 4,426,231, Cl. 106-288.00Q.
Hombach, Rudolf: *See*—
Konig, Eberhard; Hombach, Rudolf; Dollhausen, Manfred; and Pedain, Josef, 4,426,487, Cl. 524-710.000.
Honda, Giken, Kogyo, Kabushiki, Kaisha: *See*—
Gotoda, Yusuke, 4,425,989, Cl. 192-48.920.
Michiuchi, Masayuki, 4,425,977, Cl. 180-225.000.
Hondo, Takashi: *See*—
Hirano, Hiroaki; and Hondo, Takashi, 4,426,594, Cl. 310-233.000.
Honeywell Inc.: *See*—
Lohmann, Arthur M., 4,425,834, Cl. 89-1.00A.
Honeywell Information Systems Inc.: *See*—
Tague, Steven A.; and Negi, Virendra S., 4,426,680, Cl. 364-200.000.
Tague, Steven A.; and Negi, Virendra S., 4,426,680, Cl. 364-200.000.
Yu, Kin C.; and Goss, Gary J., 4,426,679, Cl. 364-200.000.
Hons-Olivier, Jacques: *See*—
Fournie, Rene; Besnard, Francois; Hons-Olivier, Jacques; and Pierre, Alexandre, 4,426,086, Cl. 277-1.000.
Hopkins, Robert W., to Calumite Company, The. Metallic sectional liquid-cooled runners. 4,426,067, Cl. 266-191.000.
Hori, Hiromi: *See*—
Sudo, Masatoshi; Hori, Hiromi; Tsukatani, Ichiro; and Shibata, Zenichi, 4,426,235, Cl. 148-12.00C.
Horii, Taichi; Horii, Taro; and Haraguchi, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for sorting fruits, vegetables or the like by weight. 4,426,006, Cl. 209-593.000.
Horii, Taro: *See*—
Horii, Taichi; Horii, Taro; and Haraguchi, Kazuo, 4,426,006, Cl. 209-593.000.
Horike, Masanori; and Ebi, Yutaka, to Ricoh Company, Ltd. Ink jet printing apparatus. 4,426,652, Cl. 346-75.000.
Horner, Ernst L.; Knolle, Jurgen C.; and Grimm, Hans, to Saat- und Erntetechnik GmbH. Method for the homogeneous complete encapsulation of individual grains of pourable material and apparatus for its production. 4,425,865, Cl. 118-19.000.
Horton Industries, Inc.: *See*—
Schilling, Hugh K., 4,425,993, Cl. 192-85.00A.
Horwood Bagshaw Limited: *See*—
Allen, Lyal D., 4,425,971, Cl. 172-311.000.
Hosaka, Tomiharu: *See*—
Hotta, Shu; Hosaka, Tomiharu; Shimotsuma, Wataru; and Kishimoto, Yoshio, 4,426,546, Cl. 136-256.000.
Hoshi, Kouich: *See*—
Yoshida, Shuzo; Ono, Hirosobu; Matsuo, Masashi; Hoshi, Kouich; Sueishi, Motoharu; and Ueda, Kazuo, 4,425,895, Cl. 123-489.000.
Hosiden Electronics Co., Ltd.: *See*—
Tanaka, Masanori; Takihara, Yukio; and Masuda, Toru, 4,426,558, Cl. 200-51.090.
Hosokawa, Teijiro; Kako, Shigetoshi; and Hagino, Kazuyuki, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Textile printing paste composition with highly substituted carboxymethyl cellulose. 4,426,206, Cl. 8-528.000.
Hotchkiss, Harry W.: *See*—
Meitner, Gary H.; and Hotchkiss, Harry W., 4,426,417, Cl. 428-195.000.
Hotta, Shu; Hosaka, Tomiharu; Shimotsuma, Wataru; and Kishimoto, Yoshio, to Matsushita Electric Industrial Company, Limited. Functional electric devices. 4,426,546, Cl. 136-256.000.
Howarth, Thomas T., to Beecham Group Limited. Clavulanic acid derivatives their preparation and use. 4,426,377, Cl. 424-114.000.
Howmet Aluminum Corp.: *See*—
Player, Wayne H., 4,425,747, Cl. 52-404.000.
Hoy, Kenneth L.; and Hoy, Richard C., to Union Carbide Corporation. Polymers with hydrophobe bunches. 4,426,485, Cl. 524-591.000.
Hoy, Richard C.: *See*—
Hoy, Kenneth L.; and Hoy, Richard C., 4,426,485, Cl. 524-591.000.
Hozumi, Motoo; Tsushima, Susumu; and Yoshioka, Yoshio, to Takeda Chemical Industries, Ltd. Certain phosphoric acid ester derivatives of 1,3-dioxy propane. 4,426,525, Cl. 546-22.000.
Hrovat, Milan: *See*—
Hackstein, Karl-Gerhard; Hrovat, Milan; Huschka, Hans; and Koch, Karl-Heinz, 4,426,338, Cl. 264-0.500.
Hryck, Michael D.: *See*—
Carrington, James E.; Hryck, Michael D.; Skinner, Dean W.; and Westcott, Gerald R., 4,425,844, Cl. 101-93.140.
Hsiung, Hansen M., to Eli Lilly and Company. Process for de-cyanoethylating blocked nucleotides. 4,426,517, Cl. 536-27.000.
Hubbard, Jack L.: *See*—
Boucher, Harry; and Hubbard, Jack L., 4,425,796, Cl. 73-312.000.
Hubert, Bernard; and Blancke, Bernard, to Societe Nationale Industrielle Aerospatiale. Process and device for aligning the roll axis of a satellite with a desired direction. 4,426,052, Cl. 244-168.000.
Hughes Aircraft Company: *See*—
Cargille, Donald R., 4,426,591, Cl. 307-358.000.
Fouse, Scott D., 4,426,629, Cl. 333-165.000.
Hughes, Eric, to Rolls-Royce Limited. Gas turbine dual fuel burners. 4,425,755, Cl. 60-39.550.
Hughes Tool Company: *See*—
Vandevier, Joseph E., 4,426,124, Cl. 339-94.00M.
Huiles, Goudrons et Derives: *See*—
Couderc, Pierre, 4,426,160, Cl. 374-45.000.
Hull, J. Richard, to Advanced Systems Incorporated. Fluid flow control mechanism for circuit board processing apparatus. 4,425,869, Cl. 118-314.000.
Hungerford, Gordon P., to Mobil Oil Corporation. Clear aquagel polyimide film. 4,426,486, Cl. 524-600.000.
Hunt, John: *See*—
Keeling, Robert A.; and Hunt, John, 4,426,227, Cl. 106-27.000.
Huriau, Alain, to Thomson-CSF. Process for the transmission of service signals for a digital radio beam, as well as transmitter and receiver for using such a process. 4,426,711, Cl. 375-17.000.
Hurst, G. Samuel; Payne, Marvin G.; Chen, Chung-Hsuan; and Parks, James E., to Atom Sciences, Inc. Method and apparatus for noble gas atom detection with isotopic selectivity. 4,426,576, Cl. 250-283.000.
Huschka, Hans: *See*—
Hackstein, Karl-Gerhard; Hrovat, Milan; Huschka, Hans; and Koch, Karl-Heinz, 4,426,338, Cl. 264-0.500.
Hvostik, Walter: *See*—
Muellner, William C.; and Hvostik, Walter, 4,426,651, Cl. 346-136.000.
Hwang, James C.: *See*—
DiLorenzo, James V.; Hwang, James C.; Niehaus, William C.; Schlosser, Wolfgang O. W.; and Wemple, Stuart H., 4,426,656, Cl. 357-22.000.
Hydratron Fuels, Inc.: *See*—
Fetsch, Joseph T., 4,425,933, Cl. 137-172.000.
Hydril Company: *See*—
Willis, William; and Chivens, Clyde C., 4,425,715, Cl. 33-199.00R.
Ichikawa, Akira: *See*—
Komatsu, Akio; Ichikawa, Akira; Hataoka, Nobuo; Kitazume, Yoshiaki; and Umemura, Kazuhiro, 4,426,551, Cl. 381-41.000.
Ichikawa, Toshiji; Watanabe, Teruko; and Asada, Yoshimitsu, to Terumo Corporation. Apparatus for separating blood. 4,426,290, Cl. 210-516.000.
Ichikin, Ltd., The: *See*—
Kawaguchi, Bunshiro, 4,425,718, Cl. 34-1.000.
Ida, Noble; Nelson, Paul E.; Haugen, Peter N.; Aho, Robert T.; and Lucas, Andrew A., to Storage Technology Corporation. Portable gold recovery apparatus and method for using same. 4,426,251, Cl. 156-656.000.
Ida, Noble N.; and Wagner, William D., to Storage Technology Corporation. Gold recovery method. 4,426,225, Cl. 75-118.00R.
Igarashi, Sadao: *See*—
Yoshisato, Akiyuki; and Igarashi, Sadao, 4,426,627, Cl. 331-12.000.
Igarashi, Toshiji: *See*—
Sugimoto, Hachiro; Nakamura, Takaharu; Hamazo, Sachiyuki; Igarashi, Toshiji; and Daiku, Yoshiharu, 4,426,383, Cl. 424-253.000.
Ikemoto, Isao; and Tamura, Akihiko, to Konishiroku Photo Industry Co., Ltd. Mounting structure for developing unit with a magnetic brush. 4,426,148, Cl. 355-3.0DD.
Ikezaki, Katuzi: *See*—
Ataka, Yasukazu; Ikezaki, Katuzi; and Umeda, Katsuhiko, 4,426,211, Cl. 55-296.000.
Ilar, Franc; and Metzger, Fridolin, to BBC Brown, Boveri & Company, Limited. Method of protection of electrical networks in the event of power transients by means of a surge arrester and a surge arrester for the performance of the method. 4,426,670, Cl. 361-79.000.
Ilius, Siegfried K. Clamp consisting of a steel band loop. 4,425,681, Cl. 24-20.00S.
Illinois Tool Works Inc.: *See*—
Briggs, Paul C., 4,426,243, Cl. 156-307.300.
Imai, Akira: *See*—
Suzuki, Toshiyuki; Matsumura, Funiaki; Maeda, Hiroshi; Imai, Akira; and Kurokawa, Nobuo, 4,426,337, Cl. 264-4.000.
Imai, Chihiro: *See*—
Miyazaki, Makoto; Nomura, Takeshi; Imai, Chihiro; and Yoda, Makoto, 4,426,314, Cl. 502-169.000.
Imamura, Saburo: *See*—
Tamamura, Toshiaki; Imamura, Saburo; Morita, Masao; and Kogure, Osamu, 4,426,247, Cl. 156-643.000.
Imazeki, Ryoji; Yamazaki, Etsuo; and Matsuura, Hitoshi, to Fujitsu Fanuc Limited. Tracer control system. 4,426,180, Cl. 409-99.000.
IMI Marston Limited: *See*—
Preston, Frederick R.; Grosvenor, Ronald L.; and Derry, Cecil, 4,426,015, Cl. 220-403.000.
Imperial Chemical Industries Limited: *See*—
Becconsall, Jack K.; Cramp, John H. W.; Reid, Robert F.; Moore, Reginald C.; Rye, Barry J.; and Thomas, Eric L., 4,426,640, Cl. 340-632.000.
Imperial Stamp & Engraving Co.: *See*—
Hegg, Hendrick C., 4,426,164, Cl. 400-46.000.
Indiana Mills & Manufacturing, Inc.: *See*—
Anthony, James R.; and Lortz, Allan R., 4,425,688, Cl. 24-656.000.
Industrial Metal Products Corporation: *See*—
Judge, Edward E., Jr., 4,425,776, Cl. 72-306.000.
Ingersoll-Rand Company: *See*—
Krasnoff, Eugene L., 4,425,835, Cl. 91-317.000.
Ingestrom, Curt H. Solar heating system in a building. 4,425,906, Cl. 126-427.000.
Ingram Corporation: *See*—
Friss, Robert; and Cain, Troy D., 4,426,182, Cl. 414-22.000.
Inman, Frank S.; and Pelham, Joseph E., to Thiokol Corporation. Non-radiating extendible cloth exit cone for rocket nozzles. 4,426,038, Cl. 239-265.150.
Innes, John E.: *See*—
Bann, Robert F.; and Innes, John E., 4,426,205, Cl. 8-523.000.

Inomata, Juro: *See*—
Abiru, Akira; Sugimoto, Masahiro; and Inomata, Juro, 4,426,657, Cl. 357-29.000.
Inoue, Hideaki: *See*—
Saiki, Shuji; Sato, Katuaki; Sato, Kazue; Ishikawa, Seiichi; Inoue, Hideaki; and Tanaka, Tsuneo, 4,426,556, Cl. 179-115.5DV.
Inoue, Hiroshi; Isoi, Masaaki; and Sei, Kazuo, to Toa Nenryo Kogyo Kabushiki Kaisha. Polyethylene composition comprising lidpe and rubber. 4,426,498, Cl. 525-240.000.
Inoue, Mitsuyori: *See*—
Kokura, Tsunehiko; and Inoue, Mitsuyori, 4,426,398, Cl. 426-72.000.
Institut Francais du Petrole: *See*—
Beauducel, Claude; and Cretin, Jacques, 4,426,624, Cl. 330-86.000.
Institut Problem Litiya Akademii Nauk Ukrainskoi SSR: *See*—
Zhukov, Leonid F.; and Chugunny, Evgeny G., 4,426,457, Cl. 501-128.000.
International Business Machines Corporation: *See*—
Bhatia, Harsaran S.; Eardley, David B.; and Gaur, Santosh P., 4,426,655, Cl. 357-21.000.
Bohg, Armin; and Hartmann, Kurt, 4,425,845, Cl. 101-93.340.
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; and Nehmiz, Peter, 4,426,584, Cl. 250-492.200.
Brunsch, Arwed; Ruh, Wolf-Dieter; and Trippel, Gerhard, 4,426,265, Cl. 204-192.00M.
Carrington, James E.; Hryck, Michael D.; Skinner, Dean W.; and Westcott, Gerald R., 4,425,844, Cl. 101-93.140.
Chang, Tai-Hon P.; Coane, Phillip J.; Hohn, Fritz-Jurgen; and Kern, Dieter P., 4,426,583, Cl. 250-398.000.
Edlund, Olof A.; and Enser, Mats A., 4,426,731, Cl. 382-56.000.
Ephrath, Linda M., 4,426,274, Cl. 204-298.000.
Freeouf, John L.; Kirchner, Peter D.; Pettit, George D.; and Woodall, Jerry M., 4,426,237, Cl. 148-175.000.
Galwey, Ronald K.; and Kanazawa, Kay K., 4,426,621, Cl. 324-439.000.
Henle, Robert A.; and Johnson, Alfred H., 4,426,689, Cl. 365-52.000.
Henle, Robert A.; and Johnson, Alfred H., 4,426,689, Cl. 365-52.000.
Kranik, John R.; Melvin, George E.; and Mueller, Wolfgang F., 4,425,829, Cl. 83-62.100.
Libby, Edwin L.; Maddox, Randall A.; and Roberts, Douglas J., 4,426,153, Cl. 355-3.00R.
Martin, David H., 4,426,643, Cl. 340-713.000.
Richard, Maurice E.; and Winarski, Daniel J., 4,426,047, Cl. 242-197.000.
Sakmann, Walter H., 4,425,846, Cl. 101-111.000.
International Harvester Co.: *See*—
Lienemann, Darlo E.; Ledermann, Donald L.; and Wunschl, Nicholas H., 4,425,857, Cl. 111-85.000.
International Paint Public Limited Company: *See*—
Sghibartz, Cristian M., 4,426,464, Cl. 523-122.000.
International Precision Incorporated: *See*—
Koike, Hirotami; Kyogoku, Hideaki; and Watanabe, Masaru, 4,426,577, Cl. 250-310.000.
International Telephone and Telegraph Corporation: *See*—
Murphy, Kent A., 4,426,215, Cl. 65-4.210.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Ottow, Alexander B.; Stiegeler, Arthur; and Tjaden, Jan, 4,426,401, Cl. 426-394.000.
Intrater, Josef; and Bertoldo, Gene, to Advanced Technology Inc. Ceramic, cermet or metal composites. 4,426,423, Cl. 428-408.000.
Invo Spline, Inc.: *See*—
Perry, Louis J., 4,426,177, Cl. 408-8.000.
Ionics, Incorporated: *See*—
Jain, Surendar, 4,426,323, Cl. 260-112.00R.
Irako, Koichi: *See*—
Watabe, Yoji; Takeichi, Hideo; and Irako, Koichi, 4,426,459, Cl. 521-42.000.
IRECO Chemicals: *See*—
Wasson, Daniel A., 4,426,238, Cl. 149-60.000.
Irro, Otmar, to Siemens Aktiengesellschaft. Printing device with integrated print head fastening and adjustment. 4,426,165, Cl. 400-57.000.
Irvoas, Yves. Device for the feeding of an internal combustion motor with gas. 4,425,897, Cl. 123-527.000.
Isert, Michel: *See*—
Bacot, Pierre C. A.; and Isert, Michel, 4,426,681, Cl. 364-200.000.
Ishihara, Masahiro: *See*—
Tachikawa, Hajime; and Ishihara, Masahiro, 4,426,572, Cl. 219-502.000.
Ishikawa, Seiichi: *See*—
Saiki, Shuji; Sato, Katuaki; Sato, Kazue; Ishikawa, Seiichi; Inoue, Hideaki; and Tanaka, Tsuneo, 4,426,556, Cl. 179-115.5DV.
Ishikura, Tomoyuki: *See*—
Okabe, Mitsuyasu; Yoshioka, Takeo; Fukagawa, Yasuo; Okamoto, Rokuro; Kouno, Kageaki; and Ishikura, Tomoyuki, 4,426,390, Cl. 424-274.000.
Ishitani, Eiichi, to Brother Kogyo Kabushiki Kaisha. Zig zag sewing machine. 4,425,859, Cl. 112-158.00R.
Ishizaki, Hiroyuki: *See*—
Yamaguchi, Hisashi; Kawada, Toyoshi; Kashiwara, Hirofumi; Ishizaki, Hiroyuki; and Murase, Kenji, 4,426,646, Cl. 340-769.000.
Isler, Eugen: *See*—
Luthy, Hans; Isler, Eugen; Meier, Ewald; and Zimmermann, Max, 4,425,958, Cl. 164-119.000.
Isoi, Masaaki: *See*—
Inoue, Hiroshi; Isoi, Masaaki; and Sei, Kazuo, 4,426,498, Cl. 525-240.000.
Ito, Noboru: *See*—
Kohri, Toshitaro; Kato, Hitoshi; and Ito, Noboru, 4,426,433, Cl. 430-109.000.
Ito, Yoshiyuki: *See*—
Okuya, Tsutae; and Ito, Yoshiyuki, 4,426,634, Cl. 338-161.000.
Itoh, Ayao: *See*—
Ogura, Ichiro; and Itoh, Ayao, 4,425,805, Cl. 73-861.290.
Itoh, Kazuomi: *See*—
Mizuno, Masamitsu; Itoh, Kazuomi; and Urushibara, Masahiro, 4,426,613, Cl. 322-21.000.
Itoh, Kenji, to Victor Company of Japan, Ltd.; and Victor Company of Japan, Ltd. High-speed tape transport system. 4,426,668, Cl. 360-73.000.
ITT Industries, Inc.: *See*—
Burgdorf, Jochen; and Keiner, Karl, 4,426,117, Cl. 303-6.00C.
Nordin, Dag E. V., 4,425,699, Cl. 29-505.000.
Iura, Yukio; Yamamichi, Masayoshi; Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Camera employing a flash illumination device and a flash photographing system. 4,426,142, Cl. 354-412.000.
Ivanov, Konstantin, to Ethicon, Inc. Surgical clip applier with in-line cartridge and interruptable biased feeder. 4,425,915, Cl. 128-325.000.
Iwahashi, Haruo: *See*—
Tarumi, Noriyoshi; Iwahashi, Haruo; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,426,654, Cl. 346-159.000.
Iwane, Yasuhiko, to Alps Electric Co., Ltd. Serial printer having two carriages carrying respective type wheels and movable independently. 4,426,167, Cl. 400-159.000.
Iwatani Sangyo Kabushiki Kaisha: *See*—
Kokura, Tsunehiko; and Inoue, Mitsuyori, 4,426,398, Cl. 426-72.000.
J. I. Case Company: *See*—
Baylor, John M., 4,426,091, Cl. 277-83.000.
Jackson, Raymond P., to United States of America, Army. Process for coating rifle tubes. 4,426,248, Cl. 156-645.000.
Jacob, Keith D.: *See*—
Apple, William C.; and Jacob, Keith D., 4,426,637, Cl. 340-825.650.
Jacobs, Harold: *See*—
Malecki, Edmund E.; and Jacobs, Harold, 4,426,628, Cl. 331-96.000.
Jacobsen, David T.; and Klopfenstein, Jerome P., to General Foods Corporation. Removable faceplate compactor ram. 4,425,843, Cl. 100-229.00A.
Jacobson, Sava. Tape drive transfer system for cassette telephone answering device with remote controlled playout. 4,426,554, Cl. 179-6.070.
Jacquemin, Marie N.: *See*—
Lainez, Lucien; Brandelong, Gerard; and Jacquemin, Marie N., 4,426,122, Cl. 339-45.00M.
Jacquet, Bernard; Papantoniou, Christos; and Mondet, Jean, to L'Oreal. Cosmetic compositions for the hair and the skin based on polymers which contain amino groups and recurring units having a cyclic structure. 4,426,375, Cl. 424-70.000.
Jacuzzi Inc.: *See*—
Puckett, Joe D.; and Bryant, Donald L., 4,426,286, Cl. 210-121.000.
Jaecklin, Andre: *See*—
de Bruyne, Patrick; Jaecklin, Andre; and Eisele, Dieter, 4,426,659, Cl. 357-74.000.
Jain, Surendar, to Ionics, Incorporated. Selected recovery of proteins from fermentation broths. 4,426,323, Cl. 260-112.00R.
Jakobsen, Kjell M.; Nilsson, Claes T.; and Larsson, Lars G., to PLM Aktiebolag. Article of plastic material having a neck portion including annular protuberances with monoaxially oriented material. 4,426,416, Cl. 428-36.000.
Jamieson, Geoffrey A.: *See*—
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,426,304, Cl. 252-8.750.
Jarke Corporation: *See*—
Jay, Richard S., 4,426,011, Cl. 211-193.000.
Jasper, Lee R.: *See*—
Liu, Chi S.; Williams, Roy K.; Jasper, Lee R.; and Hensler, Norman A., 4,426,706, Cl. 372-86.000.
Jastram-Werke GmbH & Co. KG.: *See*—
Munte, Harm-Hinrich, 4,426,288, Cl. 210-242.300.
Jautelat, Manfred; and Arlt, Dieter, to Bayer Aktiengesellschaft. Preparation of 2-(2-2-dimethyl-3-buten-1-yl)-2-oxazolines. 4,426,529, Cl. 548-216.000.
Jay, Richard S., to Jarke Corporation. Modular cantilever rack. 4,426,011, Cl. 211-193.000.
Jefferson, Robert C. Tester for key duplicating machines. 4,426,179, Cl. 409-82.000.
Jeglinski, Werner, to U.S. Philips Corporation. Method of and device for manufacturing a jet nozzle plate for ink jet printers. 4,425,777, Cl. 72-325.000.
Jenkins, Howard S.: *See*—
Zegar, Martin J.; Kish, Nicholas W.; Rusnica, Edward J.; Jenkins, Howard S.; and Sarver, Stephen J., 4,426,350, Cl. 376-283.000.
Jessup, Frank L., to Kaiser, Robert S. Timing apparatus. 4,426,639, Cl. 340-528.000.
Jessup, William H.: *See*—
Rodrigues, John G., Jr.; Rettkowski, Gale F.; and Jessup, William H., 4,426,096, Cl. 280-411.00C.

Jetter, Milton W. Clock alarm control system employing a push button alarm-deactivation switch which must be held depressed for a time period. 4,426,157, Cl. 368-73.000.

Jidosha Kiki Co., Ltd.: *See*—
Minegishi, Sokichi; Takizawa, Tozo; and Furusawa, Morimasa, 4,425,692, Cl. 29-611.000.

Johansson, Arne I. Fail-safe device for a lid of a pressure vessel. 4,426,358, Cl. 422-112.000.

John Wyeth & Brother Ltd.: *See*—
Archibald, John L.; and Ward, Terrence J., 4,426,387, Cl. 424-267.000.

Johns, Don H.: *See*—
Cornell, Stephen W.; and Johns, Don H., 4,426,347, Cl. 264-294.000.

Johnsen, Oystein, to Myrens Verksted A/S. Apparatus for treating fibrous material with a gas. 4,426,256, Cl. 162-237.000.

Johnson, Alfred H.: *See*—
Henle, Robert A.; and Johnson, Alfred H., 4,426,689, Cl. 365-52.000.

Johnson, Raymond; and Kenny, Ronald W. Shower bath units. 4,425,672, Cl. 4-596.000.

Johnson, Timothy W., to Phillips Petroleum Company. Polymer solubilization. 4,426,500, Cl. 525-537.000.

Johnson, Walter T.; and Gross, Nelson B., to McQuay Inc. Sectioned cabinet for room air conditioning unit. 4,426,120, Cl. 312-100.000.

Johnson, William C.: *See*—
Alston, William W., Jr.; Bloom, William G.; and Johnson, William C., 4,425,919, Cl. 128-658.000.

Johnston, Linda G.: *See*—
Bailey, Joseph; Clarke, David; and Johnston, Linda G., 4,426,326, Cl. 260-146.00R.

Jordaan, Ian J.: *See*—
Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; Shrive, Nigel G.; and Raymont, Michael E. D., 4,426,456, Cl. 501-84.000.

Jorgenson, Gordon K., to C-I-L Inc. Primer assembly. 4,425,849, Cl. 102-275.120.

Jos. Dyson & Sons, Inc.: *See*—
Wolf, Theodore L.; Rossman, John A.; Quinn, Russell C.; and Kish, Thomas J., 4,426,188, Cl. 414-667.000.

Jos. Schlitz Brewing Company: *See*—
Cherchian Ara A.; Elert, Karl; and Ast, Gunther E., 4,426,013, Cl. 220-66.000.

Jozuka, Masao; and Ohmura, Kazuhiro, to Brother Kogyo Kabushiki Kaisha. Serial impact printer for multicolor printing. 4,426,168, Cl. 400-224.000.

Jozwiak, Phillip C.: *See*—
Brown, Richard; and Jozwiak, Phillip C., 4,426,249, Cl. 156-653.000.

Judge, Edward E., Jr., to Industrial Metal Products Corporation. Production workpiece straightening system. 4,425,776, Cl. 72-306.000.

Julien, Paul C.: *See*—
Lewis, Richard B.; Julien, Paul C.; Gruber, Robert J.; and Koehler, Richard F., Jr., 4,426,436, Cl. 430-137.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Sudo, Masatoshi; Hori, Hiromi; Tsukatani, Ichiro; and Shibata, Zenichi, 4,426,235, Cl. 148-12.00C.

Kageyama, Hideaki: *See*—
Sugino, Kazuo; Kageyama, Hideaki; and Masumoto, Hiroki, 4,426,236, Cl. 148-36.000.

Kahn, Leonard R. Multiple system AM stereo receiver and pilot signal detector. 4,426,728, Cl. 381-15.000.

Kaiser, Robert S.: *See*—
Jessup, Frank L., 4,426,639, Cl. 340-528.000.

Kajimura, Takashi: *See*—
Kuroda, Takao; Kajimura, Takashi; Umeda, Jun-ichi; and Saito, Katsutoshi, 4,426,703, Cl. 372-46.000.

Kako, Shigetoshi: *See*—
Hosokawa, Teijiro; Kako, Shigetoshi; and Hagino, Kazuyuki, 4,426,206, Cl. 8-528.000.

Kalashnikov, Leonid F.: *See*—
Shapiro, Anatoly S.; Kalashnikov, Leonid F.; Leontiev, Nikolai I.; Polyakov, Vladimir I.; and Steblevsky, Anatoly A., 4,426,190, Cl. 415-74.000.

Kalmanson, Samuel. Head assembly for a towing device. 4,426,098, Cl. 280-504.000.

Kamath, Hundi P.; and Leder, Jeffrey C., to Raychem Corporation. Method of making electrical devices comprising conductive polymer compositions. 4,426,339, Cl. 264-22.000.

Kammer, Paul A.; and Gamberg, Edward R., to Eutectic Corporation. Nickel-base welding electrode. 4,426,428, Cl. 428-561.000.

Kamp, Ewald A., to Union Carbide Corporation. Safety blade for severing stretchable film. 4,426,029, Cl. 225-49.000.

Kanade, Takeo: *See*—
Asada, Haruhiko; and Kanade, Takeo, 4,425,818, Cl. 74-469.000.

Kanai, Hiromi: *See*—
Oritsuki, Ryoji; Watanabe, Tohru; Shirahashi, Kazuo; Kanai, Hiromi; and Odawara, Kozo, 4,426,548, Cl. 174-72.00R.

Kanazawa, Kay K.: *See*—
Galwey, Ronald K.; and Kanazawa, Kay K., 4,426,621, Cl. 324-439.000.

Kaneda, Aizo: *See*—
Tsuzuku, Susumu; Kaneda, Aizo; Saeki, Junichi; and Aoki, Masayoshi, 4,426,341, Cl. 264-40.100.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Asada, Masahiro; Matsuura, Miyuki; and Yonezawa, Kazuya, 4,426,511, Cl. 528-122.000.

Kania, Tadeusz E. Animal trap. 4,425,732, Cl. 43-81.000.

Kanzaki Paper Mfg. Co., Ltd.: *See*—
Arai, Naoto; Tuji, Takuji; and Yoneda, Hiroshi, 4,426,424, Cl. 428-411.000.

Kape, James M., to Pennwalt Corporation. Process and composition for preparing aluminum surfaces for anodizing. 4,426,252, Cl. 156-665.000.

Kashimura, Yuichi; Suda, Seiji; and Sugiura, Noboru, to Hitachi, Ltd. Engine knock control apparatus. 4,425,891, Cl. 123-425.000.

Kashiwada, Akio: *See*—
Yoshida, Mitsuo; Masuda, Yoshinori; and Kashiwada, Akio, 4,426,271, Cl. 204-296.000.

Kashiwara, Hirofumi: *See*—
Yamaguchi, Hisashi; Kawada, Toyoshi; Kashiwara, Hirofumi; Ishizaki, Hiroyuki; and Murase, Kenji, 4,426,646, Cl. 340-769.000.

Kasperkovitz, Wolfdietrich G., to U.S. Philips Corporation. Radio receiver comprising a frequency locked loop with audio frequency feedback, and a muting circuit. 4,426,735, Cl. 455-222.000.

Kato, Hisakatsu: *See*—
Yamada, Koichi; Harato, Takuo; Kato, Hisakatsu; and Shiozaki, Yasumi, 4,426,363, Cl. 423-121.000.

Kato, Hitoshi: *See*—
Kohri, Toshitaro; Kato, Hitoshi; and Ito, Noboru, 4,426,433, Cl. 430-109.000.

Kato, Keigo; and Kuroiwa, Yoshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake heating device of an internal combustion engine. 4,425,899, Cl. 123-549.000.

Kato, Masaaki; and Akashi, Tetsuji, to Nippondenso Co., Ltd. Fuel injecting device. 4,425,894, Cl. 123-446.000.

Kato, Yoji; Yamaguchi, Shunzo; Fukazawa, Takeshi; and Saigo, Shinichi, to Nippondenso Co., Ltd. Glow plug for diesel engines. 4,426,568, Cl. 219-270.000.

Katoh, Shigeru: *See*—
Kosaka, Kazumitu; Kido, Yukio; Katoh, Shigeru; and Tsutsui, Hitoshi, 4,426,159, Cl. 368-80.000.

Katsube, Junki: *See*—
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, 4,426,394, Cl. 424-330.000.

Katsuno, Mitsuaki; and Moriya, Shigeru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatically fastening seatbelt system. 4,426,102, Cl. 280-804.000.

Katsuyama, Toshio: *See*—
Matsumura, Hiroyoshi; Katsuyama, Toshio; and Suganuma, Tsuneo, 4,426,129, Cl. 350-96.330.

Kaucic, Edward M., to Graber Industries, Inc. Vertical blind mechanism. 4,425,955, Cl. 160-168.00R.

Kaupert, Guenther. Method for rapidly producing chocolate forms. 4,426,402, Cl. 426-515.000.

Kavli, Fred: *See*—
Bell, Robert L.; Willing, Robert; and Kavli, Fred, 4,426,673, Cl. 361-283.000.

Kavlico Corporation: *See*—
Bell, Robert L.; Willing, Robert; and Kavli, Fred, 4,426,673, Cl. 361-283.000.
Park, Kyong M., 4,425,799, Cl. 73-718.000.

Kawabata, Kaoru: *See*—
Yasumatsu, Toshihito; Nakase, Toshiaki; Kubozuka, Toshinori; and Kawabata, Kaoru, 4,426,477, Cl. 524-306.000.

Kawabata, Toshiaki: *See*—
Fukushima, Toshihiko; Miyamoto, Seigo; Kawashima, Kenichi; Kawabata, Toshiaki; Tani, Seijiro; and Shibata, Takanori, 4,425,765, Cl. 62-133.000.

Kawada, Shigeki; and Kobari, Katsuo, to Fujitsu Fanuc Limited. Induction motor control system. 4,426,610, Cl. 318-798.000.

Kawada, Toyoshi: *See*—
Yamaguchi, Hisashi; Kawada, Toyoshi; Kashiwara, Hirofumi; Ishizaki, Hiroyuki; and Murase, Kenji, 4,426,646, Cl. 340-769.000.

Kawaguchi, Bunshiro, to Ichikin, Ltd., The. Apparatus for development and fixation of dyes with a printed textile sheet by application of microwave emanation. 4,425,718, Cl. 34-1.000.

Kawai, Hisasi: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,425,792, Cl. 73-204.000.

Kawakami, Hajime: *See*—
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, 4,426,394, Cl. 424-330.000.

Kawanabe, Yoshihiro, to Pioneer Electronic Corporation. Signal switching circuit. 4,426,626, Cl. 330-267.000.

Kawasaki Steel Corporation: *See*—
Nagai, Isao; and Wada, Kenzo, 4,425,798, Cl. 73-659.000.
Ukena, Toshimichi; Narumi, Hiroshi; Shimizu, Takao; and Nagashima, Atsushi, 4,426,266, Cl. 204-206.000.

Kawasaki, Teruo, to Nissan Motor Company, Limited. Voice warning device with repeat mechanism for an automotive vehicle. 4,426,691, Cl. 369-21.000.

Kawashima, Kenichi: *See*—
Fukushima, Toshihiko; Miyamoto, Seigo; Kawashima, Kenichi; Kawabata, Toshiaki; Tani, Seijiro; and Shibata, Takanori, 4,425,765, Cl. 62-133.000.
Kobayashi, Koichi; Kawashima, Kenichi; and Oshio, Shuzo, 4,426,439, Cl. 430-269.000.

Kawashima, Yoshiro: *See*—
Minamizono, Junji; Hirano, Mitunori; Kawashima, Yoshiro; and Ogawa, Tadashi, 4,426,445, Cl. 430-599.000.

Kawaura, Kuninori; Yamada, Sumio; Wakatsuki, Noboru; Ono, Masaaki; Tanji, Shigeo; Fujiwara, Yoshiro; and Yanagisawa, Masanobu, to Fujitsu Limited. Acoustic surface wave device with improved band-pass characteristics. 4,426,595, Cl. 310-313.00D.

Kawazoe, Mitsuo, to Olympus Optical Co. Ltd. Power supply unit shared by camera's motor drive and electronic flash. 4,426,144, Cl. 354-145.100.

Kazuno, Kenji: *See*—
Matsumura, Shingo, deceased; Kise, Masahiro; Ozaki, Masakuni; Tada, Shinichi; Kazuno, Kenji; Watanabe, Hisao; Kunimoto, Katsutoshi; and Tsuda, Masami, 4,426,381, Cl. 424-250.000.

Kee, Yeo K.: *See*—
van Ligten, Raoul F.; and Kee, Yeo K., 4,426,139, Cl. 351-169.000.

Keeling, Robert A.; and Hunt, John, to Harrison Mayer Limited. Printing compositions. 4,426,227, Cl. 106-27.000.

Kehl, Norman J.; and Magnuson, Richard C., to Coach and Car Equipment Corporation. Unitary supporting and seat frame for rigid seat. 4,426,114, Cl. 297-232.000.

Keiner, Karl: *See*—
Burgdorf, Jochen; and Keiner, Karl, 4,426,117, Cl. 303-6.00C.

Kelly, James B., Jr. Siding board installation tool. 4,425,714, Cl. 33-187.000.

Kemeny, George A., to Westinghouse Electric Corp. Rotary switch for switching very large DC currents. 4,426,562, Cl. 200-151.000.

Kempf, Thomas: *See*—
Zimmermann, Hubert; and Kempf, Thomas, 4,426,241, Cl. 156-217.000.

Kenny, Andrew A.; and Wojtecki, Ronald J., to Eaton Corporation. Speed bias fluid pressure regulator and systems utilizing same. 4,425,931, Cl. 137-53.000.

Kenny, Ronald W.: *See*—
Johnson, Raymond; and Kenny, Ronald W., 4,425,672, Cl. 4-596.000.

Kent, Eric G., to Polysar Limited. Polymer mixtures comprising polyethylene and 1,4 polybutadiene. 4,426,497, Cl. 525-194.000.

Kern, Dieter P.: *See*—
Chang, Tai-Hon P.; Coane, Phillip J.; Hohn, Fritz-Jurgen; and Kern, Dieter P., 4,426,583, Cl. 250-398.000.

Kernforschungsanlage Julch GmbH: *See*—
Chatzipetros, Johann; and Helten, Manfred, 4,425,811, Cl. 73-863.110.

Kerstges, Ferdinand: *See*—
Gratz, Johannes; and Kerstges, Ferdinand, 4,425,745, Cl. 52-235.000.

Kersting, Hermann; and Roderfeld, Heinrich, to Claas OHG. Harvester thresher. 4,425,925, Cl. 130-22.00A.

Kervennal, Jacques; and Cognion, Jean-Marie, to Produits Chimiques Ugine Kuhlmann. Process for the manufacture of polyurethanes by carbonylation of nitrated hydroxy-aromatic compounds. 4,426,515, Cl. 528-210.000.

Kesselman, David A. Tamper indicator. 4,426,108, Cl. 292-307.00B.

Khan, Ausat A., to Du Pont de Nemours, E. I., and Company. Emulsion copolymerization process using comonomer solubility affecting additives. 4,426,501, Cl. 526-206.000.

Kibbie, William E. Device and method for escaping fire and smoke in high-rise buildings. 4,425,982, Cl. 182-36.000.

Kido, Yukio: *See*—
Kosaka, Kazumitu; Kido, Yukio; Katoh, Shigeru; and Tsutsui, Hitoshi, 4,426,159, Cl. 368-80.000.

Kiesewetter, Norbert; and Lakatos, Bertalan, to Fraunhofer-Gesellschaft Zur Forderung der Angewandten Forschung e.V. Sound absorbing building component of synthetic resin sheeting. 4,425,981, Cl. 181-286.000.

Kikkoman Corporation: *See*—
Okamura, Shigemichi; and Watanabe, Masazumi, 4,426,448, Cl. 435-146.000.

Kimberly-Clark Corporation: *See*—
Meitner, Gary H.; and Hotchkiss, Harry W., 4,426,417, Cl. 428-195.000.

Kimblin, Clive W., to Westinghouse Electric Corp. Reduced pressure electrical switch. 4,426,560, Cl. 200-144.00B.

Kimura, Kenji, to Olympus Optical Co. Ltd.; and Olympus Optical Co. Ltd. Beam position detecting device for optical disc apparatus. 4,426,694, Cl. 369-46.000.

Kimura, Sukeaki, to Suzuki Motor Company Limited. Small-type four-wheel automobile. 4,425,976, Cl. 180-56.000.

King-Seeley Thermos Co.: *See*—
Nelson, Kenneth L., 4,425,964, Cl. 165-171.000.

King, Terry S., to Exxon Research & Engineering Co. Process for production of aliphatic alcohols. 4,426,541, Cl. 568-881.000.

Kipp, Louis D., to EDS-IDAB, Inc. Method for counting signatures employing a weighing technique. 4,425,974, Cl. 177-1.000.

Kirchner, Peter D.: *See*—
Freeouf, John L.; Kirchner, Peter D.; Pettit, George D.; and Woodall, Jerry M., 4,426,237, Cl. 148-175.000.

Kirihara, Seishin: *See*—
Tsuchiya, Keiichi; Hisano, Katsukuni; Tan, Toshimi; Kobayashi, Masahiro; Kobayashi, Kei; Ueda, Kazuhiko; Kirihara, Seishin; Yoshioka, Takatoshi; and Shiga, Masao, 4,426,162, Cl. 384-280.000.

Kirschner, Thomas F., to RCA Corporation. Process for improving dimensional stability of video disc caddy. 4,426,349, Cl. 264-346.000.

Kise, Masahiro: *See*—
Matsumura, Shingo, deceased; Kise, Masahiro; Ozaki, Masakuni; Tada, Shinichi; Kazuno, Kenji; Watanabe, Hisao; Kunimoto, Katsutoshi; and Tsuda, Masami, 4,426,381, Cl. 424-250.000.

Kiselnikov, Valentin N.; Shubin, Arkady A.; Vyalkov, Vladislav V.; Kruglov, Vitaly A.; Loginova, Tamara F.; Romanov, Viktor S.; Ovchinnikov, Lev N.; Varlamov, Valentin I.; Makarov, Jury A.; Penkov, Evgeny I.; Shvareva, Galina N.; and Shtefan, Vladimir N. Process for producing (co)-polymers from α,β unsaturated acid derivatives. 4,426,507, Cl. 526-303.100.

Kish, Nicholas W.: *See*—
Zegar, Martin J.; Kish, Nicholas W.; Rusnica, Edward J.; Jenkins, Howard S.; and Sarver, Stephen J., 4,426,350, Cl. 376-283.000.

Kish, Thomas J.: *See*—
Wolf, Theodore L.; Rossman, John A.; Quinn, Russell C.; and Kish, Thomas J., 4,426,188, Cl. 414-667.000.

Kishimoto, Yoshio: *See*—
Hotta, Shu; Hosaka, Tomiharu; Shimotsuma, Wataru; and Kishimoto, Yoshio, 4,426,546, Cl. 136-256.000.

Kissell, Robert R., to Avco Corporation. Pneumatic shock testing machine with digital control. 4,426,683, Cl. 364-508.000.

Kitazume, Yoshiaki: *See*—
Komatsu, Akio; Ichikawa, Akira; Hataoka, Nobuo; Kitazume, Yoshiaki; and Umemura, Kazuhiro, 4,426,551, Cl. 381-41.000.

Klapettek, Gerhard: *See*—
Kuemmel, Klaus; Klapettek, Gerhard; and Schneider, Siegfried, 4,426,149, Cl. 355-8.000.

Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, to Degussa AG. α-(3-Cyano-propanoyl)-aminocarboxylic acid derivatives. 4,426,532, Cl. 548-344.000.

Klein, David M.; Wimberger, Richard J.; Rocheleau, Michael O.; and Helms, Randall D., to W. R. Grace & Co. Compact air bar assembly for contactless web support. 4,425,719, Cl. 34-156.000.

Kleineisel, Gustav: *See*—
Herbert, Karl; and Kleineisel, Gustav, 4,426,195, Cl. 417-222.000.

Kleiner, Hans-Jerg; and Dursch, Walter, to Hoechst Aktiengesellschaft. Process for the preparation of vinylphosphonic acid derivatives and the use thereof. 4,426,336, Cl. 260-986.000.

Kleiner, Hans-Jerg: *See*—
Wissmann, Hans; and Kleiner, Hans-Jerg, 4,426,325, Cl. 260-112.50R.

Klevstad, Sven M., to Landstingens Inkopscentral, Lic, Ekonomisk Forening. Leg supporting device for obstetrical tables. 4,426,071, Cl. 269-325.000.

Klimowicz, Richard F.: *See*—
Adams, George E., III; Bailey, Edwin C.; Klimowicz, Richard F.; and Cope, Geoffrey W., 4,426,012, Cl. 213-135.000.

Kline, Richard B., II: *See*—
Neumann, Leopold; Kline, Richard B., II; and McMorrow, Richard H., Jr., 4,426,644, Cl. 340-720.000.

Kling, Michael J., to Bear Automotive Service Equipment Company. Computer based engine analyzer with hardware cylinder counter. 4,425,791, Cl. 73-117.300.

Klopfenstein, Jerome P.: *See*—
Jacobsen, David T.; and Klopfenstein, Jerome P., 4,425,843, Cl. 100-229.00A.

Knapp, Heinrich; and Schillinger, Rainer, to Robert Bosch GmbH. Apparatus for regulating the idling rpm of an internal combustion engine. 4,425,887, Cl. 123-339.000.

Knickerbocker, Michael G., to Seaquist Valve Co. Continuous spray overcap. 4,426,025, Cl. 222-182.000.

Knickerbocker, Michael G., to Seaquist Valve Co., Div. of Pittway Corp. Aerosol assembly comprising an improved overcap. 4,426,026, Cl. 222-402.130.

Knolle, Jurgen C.: *See*—
Horner, Ernst L.; Knolle, Jurgen C.; and Grimm, Hans, 4,425,865, Cl. 118-19.000.

Knop, Karl H., to RCA Corporation. Semi-thick transmissive and reflective sinusoidal phase grating structures. 4,426,130, Cl. 350-162.200.

Knoth, Joachim: *See*—
Schwenke, Joachim; Knoth, Joachim; Marten, Rainer; and Rosomm, Herbert, 4,426,717, Cl. 378-45.000.

Kobari, Katsuo: *See*—
Kawada, Shigeki; and Kobari, Katsuo, 4,426,610, Cl. 318-798.000.

Kobayashi, Hiroaki: *See*—
Deguchi, Yukichi; Miyaji, Shinichiro; and Kobayashi, Hiroaki, 4,426,479, Cl. 524-430.000.

Kobayashi, Ikuo: *See*—
Hikino, Tadashi; Kobayashi, Ikuo; and Nagai, Takeshi, 4,426,570, Cl. 219-354.000.

Kobayashi, Kei: *See*—
Tsuchiya, Keiichi; Hisano, Katsukuni; Tan, Toshimi; Kobayashi, Masahiro; Kobayashi, Kei; Ueda, Kazuhiko; Kirihara, Seishin; Yoshioka, Takatoshi; and Shiga, Masao, 4,426,162, Cl. 384-280.000.

Kobayashi, Koichi; Kawashima, Kenichi; and Oshio, Shuzo, to Fujitsu Limited. Method and apparatus for processing negative photoresist. 4,426,439, Cl. 430-269.000.

Kobayashi, Masaaki; and Kohda, Minoru, to Matsushita Electric Industrial Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Video signal recording/reproducing apparatus. 4,426,666, Cl. 360-10.300.

Kobayashi, Masahiro: *See*—
Tsuchiya, Keiichi; Hisano, Katsukuni; Tan, Toshimi; Kobayashi, Masahiro; Kobayashi, Kei; Ueda, Kazuhiko; Kirihara, Seishin;

Yoshioka, Takatoshi; and Shiga, Masao, 4,426,162, Cl. 384-280.000.

Kobayashi, Masayoshi: *See*—
Yamashita, Shigeo; Matsuda, Hiroshi; Kobayashi, Uichiroo; Kobayashi, Masayoshi; and Nakashima, Hisao, 4,426,702, Cl. 372-45.000.

Kobayashi, Uichiroo: *See*—
Yamashita, Shigeo; Matsuda, Hiroshi; Kobayashi, Uichiroo; Kobayashi, Masayoshi; and Nakashima, Hisao, 4,426,702, Cl. 372-45.000.

Koch, Curtis J. Variable torque bicycle sprocket. 4,425,824, Cl. 74-750.00B.

Koch, Karl-Heinz: *See*—
Hackstein, Karl-Gerhard; Hrovat, Milan; Huschka, Hans; and Koch, Karl-Heinz, 4,426,338, Cl. 264-0.500.

Kochs Adler AG: *See*—
Landwehr, Gunter; and Thiele, Horst, 4,425,860, Cl. 112-311.000.

Koehler, Richard F., Jr.: *See*—
Lewis, Richard B.; Julien, Paul C.; Gruber, Robert J.; and Koehler, Richard F., Jr., 4,426,436, Cl. 430-137.000.

Kogure, Osamu: *See*—
Tamamura, Toshiaki; Imamura, Saburo; Morita, Masao; and Kogure, Osamu, 4,426,247, Cl. 156-643.000.

Kogure, Yoichiro: *See*—
Wakamatsu, Hidekazu; and Kogure, Yoichiro, 4,425,762, Cl. 60-646.000.

Kohama, Tokio; Obayashi, Hideki; Kawai, Hisai; and Egami, Tsuneyuki, to Nippon Soken, Inc. Apparatus for measuring a fluid flow rate. 4,425,792, Cl. 73-204.000.

Kohda, Minoru: *See*—
Kobayashi, Masaaki; and Kohda, Minoru, 4,426,666, Cl. 360-10.300.

Kohri, Toshitaro; Kato, Hitoshi; and Ito, Noboru, to Minolta Camera Kabushiki Kaisha. Electrophotographic developer composition of improved resistance to potential decay. 4,426,433, Cl. 430-109.000.

Kohring, Frederick C.: *See*—
Greenberger, Joseph I.; and Kohring, Frederick C., 4,425,928, Cl. 134-122.00R.

Koike, Hirotami; Kyogoku, Hideaki; and Watanabe, Masaru, to International Precision Incorporated. Electron microscope of scanning type. 4,426,577, Cl. 250-310.000.

Koike, Hiroyuki: *See*—
Sato, Yasunobu; Fukumi, Hiroshi; Koike, Hiroyuki; and Nishino, Hiroshi, 4,426,382, Cl. 424-251.000.

Koishi, Kenji: *See*—
Satoh, Isao; Yoshida, Tomio; Harigae, Shunji; and Koishi, Kenji, 4,426,693, Cl. 369-45.000.

Kokura, Tsunehiko; and Inoue, Mitsuyori, to Iwatani Sangyo Kabushiki Kaisha. Food product having a main component comprising powder made from soft shell turtles and the method of manufacture therefor. 4,426,398, Cl. 426-72.000.

Kolbe, Andreas: *See*—
Dinter, Peter; and Kolbe, Andreas, 4,426,344, Cl. 264-171.000.

Komada, Kenya, to Ricoh Company, Ltd. Printing system for facsimile reception apparatus. 4,426,653, Cl. 346-153.100.

Komamura, Tawara: *See*—
Sawada, Kiyoshi; Goto, Satoshi; Sasaki, Osamu; Takahashi, Jiro; and Komamura, Tawara, 4,426,432, Cl. 430-58.000.

Komatsu, Akio; Ichikawa, Akira; Hataoka, Nobuo; Kitazume, Yoshiaki; and Umemura, Kazuhiro, to Hitachi, Ltd. Speech recognition method and device. 4,426,551, Cl. 381-41.000.

Komatsuzaki, Nobuyuki; Tsubone, Masahiro; and Machida, Bon, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Continuous process for the production of polystyrene foamed articles. 4,426,065, Cl. 264-45.900.

Komori Printing Machinery Co., Ltd.: *See*—
Toyoda, Hideaki, 4,425,816, Cl. 74-439.000.

Kondo, Shiro; and Mizuta, Ken, to Alps Electric Co., Ltd. Push button switch having two resilient contacts operated at different times. 4,426,559, Cl. 200-67.0DB.

Konig, Eberhard; Hombach, Rudolf; Dollhausen, Manfred; and Pedain, Josef, to Bayer Aktiengesellschaft. Mixtures of NCO prepolymers containing tertiary nitrogen atoms and the use thereof as adhesives or costings. 4,426,487, Cl. 524-710.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Ikemoto, Isao; and Tamura, Akihiko, 4,426,148, Cl. 355-3.0DD.
Sakai, Yuki; and Nakamura, Hiroya, 4,426,645, Cl. 340-724.000.
Sawada, Kiyoshi; Goto, Satoshi; Sasaki, Osamu; Takahashi, Jiro; and Komamura, Tawara, 4,426,432, Cl. 430-58.000.
Shiozawa, Kazuo; and Sawano, Hiroshi, 4,426,147, Cl. 354-286.000.
Tarumi, Noriyoshi; Iwahashi, Haruo; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,426,654, Cl. 346-159.000.

Koppers Company, Inc.: *See*—
Hendrych, George, 4,426,259, Cl. 202-248.000.

Kornrumpf, William P.: *See*—
Steigerwald, Robert L.; Kornrumpf, William P.; and Walden, John P., 4,426,564, Cl. 219-10.770.

Korsen, Iverson, to American Electronic Laboratories, Inc. Tape erectable antenna mast. 4,426,650, Cl. 343-903.000.

Korte, Siegfried; Lindner, Christian; Suling, Carlhans; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Process for the production of graft polymers. 4,426,499, Cl. 525-316.000.

Kosaka, Kazumitu; Kido, Yukio; Katoh, Shigeru; and Tsutsui, Hitoshi, to Casio Computer Co., Ltd. Electronic time keeping device. 4,426,159, Cl. 368-80.000.

Koshino, Minoru: *See*—
Shimizu, Kazuyuki; and Koshino, Minoru, 4,426,713, Cl. 375-106.000.

Koshino, Yutaka: *See*—
Ohshima, Jiro; Koshino, Yutaka; Ajima, Takashi; and Yonezawa, Toshio, 4,426,234, Cl. 148-1.500.

Kosters, Peter H., to Dow Chemical Company, The. Process and apparatus for thermally cracking hydrocarbons. 4,426,278, Cl. 208-130.000.

Kosuge, Shuichi: *See*—
Fujisaki, Iwao; Kosuge, Shuichi; Ogawa, Syuu; Sato, Kimihiko; and Soeda, Toshimi, 4,425,921, Cl. 128-690.000.

Kotilainen, Heikki: *See*—
Sirkkola, Erkki; and Kotilainen, Heikki, 4,425,786, Cl. 73-12.000.

Kouno, Kageaki: *See*—
Okabe, Mitsuyasu; Yoshioka, Takeo; Fukagawa, Yasuo; Okamoto, Rokuro; Kouno, Kageaki; and Ishikura, Tomoyuki, 4,426,390, Cl. 424-274.000.

Kovacs, Richard M., Jr.: *See*—
Bradcovich, James M.; Wake, Robert H.; Kovacs, Richard M., Jr.; and Pinkstaff, Carlos D., 4,426,578, Cl. 250-363.00S.

Kozaki, Syuichi: *See*—
Funada, Fumiaki; Minezaki, Shigehiro; Kozaki, Syuichi; and Uede, Hisashi, 4,426,133, Cl. 350-334.000.

Kozima, Akio: *See*—
Hashimoto, Mitsuru; Masafumi, Ohta; Kozima, Akio; Sakai, Kiyoshi; and Sasaki, Masaomi, 4,426,327, Cl. 260-160.000.

Kracht Pumpen- und Motorenfabrik GmbH & Co. KG: *See*—
Andreev, Borislav; and Schumacher, Johannes A., 4,425,789, Cl. 73-40.50R.

Kraftwerk Union Aktiengesellschaft: *See*—
Heuckelbach, Frederik E.; Weber, Robert; and Weber, Jakob, 4,425,944, Cl. 138-89.000.
Scholz, Manfred; Fricker, Wolfgang-Peter; and Gollasch, Bernd, 4,425,963, Cl. 165-104.320.

Kramer, Gabriele: *See*—
Drawert, Friedrich; Schreier, Peter; and Kramer, Gabriele, 4,426,210, Cl. 55-73.000.

Kramer, George M., to Exxon Research and Engineering Co. Adamantyl carboxylic and sulfonic acid catalyzed paraffin-olefin alkylation. 4,426,545, Cl. 585-724.000.

Kranik, John R.; Melvin, George E.; and Mueller, Wolfgang F., to International Business Machines Corporation. Punch apparatus. 4,425,829, Cl. 83-62.100.

Krasnoff, Eugene L., to Ingersoll-Rand Company. Fluid actuator. 4,425,835, Cl. 91-317.000.

Kravitz, Stanley H.; Manocha, Ajit S.; and Willenbrock, William E., Jr., to Bell Telephone Laboratories, Incorporated. Plasma pretreatment with BCl_3 to remove passivation formed by fluorine-etch. 4,426,246, Cl. 156-643.000.

Krawczyk, Rodolphe: *See*—
Chenin, Claude; Krawczyk, Rodolphe; Marello, Georges; and Lombard, Jean-Yves, 4,426,053, Cl. 244-173.000.

Kreeger, Elsmer W.: *See*—
Stahl, Edward L.; and Kreeger, Elsmer W., 4,426,001, Cl. 206-507.000.

Kreiner, Hans-Jurg; Seif, Rudolf; and Zimmer, Wilhelm, to Munchener Apparatebau Fur Elektronische Gerate Kimmel GmbH & Co. KG; and Gesellschaft Fur Strahlen-und Umweltforschung mbH. Arrangement for measuring radioactivity concentrations. 4,426,581, Cl. 250-380.000.

Kreuz, John A.; and Hawkins, Christopher M., to Du Pont de Nemours, E. I., and Company. High speed etching of polyimide film. 4,426,253, Cl. 156-668.000.

Krishnakumar, Suppayan M.; Pocock, John F. E.; and Harry, Ieuan L., to Continental Group, Inc., The. Pallet load support. 4,426,202, Cl. 425-534.000.

Krishnan, Sivaram; and Baron, Arthur L., to Mobay Chemical Corporation. Copolycarbonate from thiodiphenol having high melt flow rates. 4,426,514, Cl. 528-204.000.

Kristiansson, Krister: *See*—
Malmqvist, Erik L.; and Kristiansson, Krister, 4,426,575, Cl. 250-253.000.

Kroger, Dieter: *See*—
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Krone GmbH: *See*—
Stoewe, Anneliese; and Hegner, Gunter, 4,426,121, Cl. 339-38.000.

Kruger, Bruno: *See*—
Hammerschmidt, Erich; Behre, Horst; Kruger, Bruno; and Winkler, Adolf, 4,426,333, Cl. 260-507.00R.

Kruglov, Vitaly A.: *See*—
Kiselnikov, Valentin N.; Shubin, Arkady A.; Vyalkov, Vladislav V.; Kruglov, Vitaly A.; Loginova, Tamara F.; Romanov, Viktor S.; Ovchinnikov, Lev N.; Varlamov, Valentin I.; Makarov, Jury A.; Penkov, Evgeny I.; Shvareva, Galina N.; and Shtefan, Vladimir N., 4,426,507, Cl. 526-303.100.

Krusche, Alfred, to Linde Aktiengesellschaft. Hydrostatic drive systems. 4,425,759, Cl. 60-420.000.

Kruto, Donald. Fluid flow control apparatus and method. 4,425,930, Cl. 137-1.000.

Kryolitselskabet Oresund A/S: *See*—
Aunsholt, Knud E. H., 4,426,282, Cl. 209-167.000.

Kryovacs Scientific Corporation: *See*—
Lam, Calvin K., 4,425,764, Cl. 62-6.000.

Kubota, James, to Omni Spectra, Inc. Coaxial connector assembly. 4,426,127, Cl. 339-177.00R.

Kubozuka, Toshinori: *See*—
Yasumatsu, Toshihito; Nakase, Toshiaki; Kubozuka, Toshinori; and Kawabata, Kaoru, 4,426,477, Cl. 524-306.000.

Kuemmel, Klaus; Klapettek, Gerhard; and Schneider, Siegfried, to Gestetner Manufacturing Limited. Photocopier scanning drive system. 4,426,149, Cl. 355-8.000.

Kuhle, Engelbert: *See*—
Dickore, Karlfried; and Kuhle, Engelbert, 4,426,523, Cl. 544-223.000.

Kulesza, Ralph J.; and Disko, Harry, to Marvin Glass & Associates. Toy vehicle device. 4,425,735, Cl. 46-202.000.

Kulischenko, Walter; and Capdevielle, Martin J., to Penwalt Corporation. Mechanism for controlling remotely disposed industrial valves and the like. 4,425,823, Cl. 74-665.0GE.

Kunimoto, Katsutoshi: *See*—
Matsumura, Shingo, deceased; Kise, Masahiro; Ozaki, Masakuni; Tada, Shinichi; Kazuno, Kenji; Watanabe, Hisao; Kunimoto, Katsutoshi; and Tsuda, Masami, 4,426,381, Cl. 424-250.000.

Kuonen, Frederick L.: *See*—
Updike, Stanley H.; Michaels, William A.; and Kuonen, Frederick L., 4,425,882, Cl. 123-90.300.

Kuramoto, Kenichi; and Nakazawa, Hideaki, to Toyo Soda Manufacturing Co., Ltd. Process for producing stable polymer emulsions. 4,426,482, Cl. 524-460.000.

Kurihara, Nobuo; Morooka, Yasuo; Nishikawa, Mitsuyo; Miura, Kiyoshi; and Nagahashi, Yoshitoshi, to Hitachi, Ltd. Method and apparatus for monitoring the shaft vibration of a rotary machine. 4,426,641, Cl. 340-683.000.

Kuriki, Tomio; and Manabe, Seiichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyester fiber dyeable under normal pressure. 4,426,516, Cl. 528-272.000.

Kuroda, Takao; Kajimura, Takashi; Umeda, Jun-ichi; and Saito, Katsutoshi, to Hitachi, Ltd. Semiconductor laser device. 4,426,703, Cl. 372-46.000.

Kuroiwa, Hiroshi; and Oyama, Yoshishige, to Hitachi, Ltd. Electronic control apparatus for internal combustion engine. 4,425,886, Cl. 123-339.000.

Kuroiwa, Yoshio: *See*—
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Kurokawa, Nobuo: *See*—
Suzuki, Toshiyuki; Matsumura, Funiaki; Maeda, Hiroshi; Imai, Akira; and Kurokawa, Nobuo, 4,426,337, Cl. 264-4.000.

Kuznetz, Lawrence. Heat exchange system for body skin. 4,425,917, Cl. 128-403.000.

Kwok, Kui C., to Graco Inc. Spray gun control valve. 4,426,039, Cl. 239-415.000.

Kyogoku, Hideaki: *See*—
Koike, Hirotami; Kyogoku, Hideaki; and Watanabe, Masaru, 4,426,577, Cl. 250-310.000.

Labouliere, Elzear R.: *See*—
De Vos, Hendrik A. J.; and Labouliere, Elzear R., 4,426,126, Cl. 339-125.00R.

Labrot, Maxime: *See*—
Denoyer, Serge; Guerin, Jacques; Labrot, Maxime; and Serrano, Jean-Pierre, 4,426,597, Cl. 313-231.410.

Lachance, Paul. Removable handrail for ladders. 4,425,984, Cl. 182-106.000.

Lainez, Lucien; Brandelong, Gerard; and Jacquemin, Marie N., to Thomson-Brandt. Microcomputer adapted to be connected to a supplementary circuit placed in a cartridge. 4,426,122, Cl. 339-45.00M.

L'Air Liquide-Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Bruni, Maurice; and Duboz, George, 4,426,207, Cl. 44-50.000.

Laitram Corporation, The: *See*—
Fowler, John T., 4,425,716, Cl. 33-355.00R.

Lajotte, Dominique; and Menet, Francis, to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel. Method of detecting the presence of speech in a telephone signal and speech detector implementing said method. 4,426,730, Cl. 381-46.000.

Lakatos, Bertalan: *See*—
Kiesewetter, Norbert; and Lakatos, Bertalan, 4,425,981, Cl. 181-286.000.

Lam, Calvin K., to Kryovacs Scientific Corporation. Micro-cryogenic system with pseudo two stage cold finger, stationary regenerative material, and pre-cooling of the working fluid. 4,425,764, Cl. 62-6.000.

Landstingens Inkopscentral, Lic, Ekonomisk Forening: *See*—
Kievstad, Sven M., 4,426,071, Cl. 269-325.000.

Landwehr, Gunter; and Thiele, Horst, to Kochs Adler AG. Workpiece feeding device for a sewing machine. 4,425,860, Cl. 112-311.000.

Lane, John E., to Parks-Cramer Company. Spinning machine information gathering apparatus and method. 4,425,754, Cl. 57-265.000.

Lang, Gustav; and Hirsemann, Achim, to Hilti Aktiengesellschaft. Device for dispensing a single-component or multi-component substance. 4,426,022, Cl. 222-130.000.

Langley, Robert C.; and Myers, Herbert, to Engelhard Corporation. Promotion of Pt-Ir catalytic electrodes with lead, tantalum, ruthenium and oxygen. 4,426,262, Cl. 204-98.000.

Larson, Noble G.; Purbrick, John A.; and Mason, Matthew T., to Massachusetts Institute of Technology. Stepping motor control system. 4,426,608, Cl. 318-685.000.

Larson, Spencer B.: *See*—
Copeland, James L.; Fernholz, Peter J.; Larson, Spencer B.; Salmonson, Duane L.; and Weick, Michael D., 4,426,362, Cl. 422-263.000.

Larsson, Lars G.: *See*—
Jakobsen, Kjell M.; Nilsson, Claes T.; and Larsson, Lars G., 4,426,416, Cl. 428-36.000.

Lasoski, Bernard A., to Syngas Company. Volatile metal carbonyl analysis. 4,426,452, Cl. 436-76.000.

Laty, Pierre: *See*—
Gimond, Jacques; Gonda, Richard; Hicter, Jean-Marie; and Laty, Pierre, 4,426,068, Cl. 266-217.000.

Laughlin, Charles E.: *See*—
Woods, John H.; Laughlin, Charles E.; and Graves, Toby R., 4,426,329, Cl. 260-398.600.

Lavanish, Jerome M.; and Van Gemert, Barry, to PPG Industries, Inc. 3-[5- Or 3-substituted-1,2,4-oxadiazol-3- or -5-yl]-1-substituted-4-substituted-5-substituted or unsubstituted-2-imidazolidinones. 4,426,527, Cl. 548-133.000.

Layher, Eberhard. Coupling for metallic scaffolds. 4,426,171, Cl. 403-49.000.

Leboutet, Hubert, to "C.G.R. MeV". Irradiation head for neutrotherapy apparatus. 4,426,351, Cl. 376-158.000.

Lechler GmbH & Co. KG: *See*—
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Ledermann, Donald L.: *See*—
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Lee, Leslie A.: *See*—
Ballard, John R.; Bennett, George H.; and Lee, Leslie A., 4,425,756, Cl. 60-39.092.

Lee, Richard J.; and Murphy, Lynn M. R., to Standard Oil Company (Indiana). Antioxidants and lubricating oil containing same. 4,426,306, Cl. 252-51.50A.

Lee, Yongsik. Fortune cookie machine. 4,426,186, Cl. 414-225.000.

Le Forestier, Rene P. Pneumatic suspension for vehicle seat. 4,426,058, Cl. 248-594.000.

Leist, Helmut J.: *See*—
Moll, Hermann; Leist, Helmut J.; Pomorin, Karl-Heinz; and Ullrich, Georg J., 4,425,918, Cl. 128-635.000.

Le Mer, Gerard. Filing drum for a column having rotary drums. 4,426,010, Cl. 211-163.000.

Lemon, Peter H. R. B.: *See*—
Quist, Ingmar P.; Railton, Jeffrey D.; and Lemon, Peter H. R. B., 4,426,467, Cl. 523-145.000.

Leodolter, Walter, to United States of America, Air Force. Tool sealing arrangement and method. 4,426,032, Cl. 228-157.000.

Leontiev, Nikolai I.: *See*—
Shapiro, Anatoly S.; Kalashnikov, Leonid F.; Leontiev, Nikolai I.; Polyakov, Vladimir I.; and Steblevsky, Anatoly A., 4,426,190, Cl. 415-74.000.

Lesk, Israel A.: *See*—
Coleman, Michael G.; and Lesk, Israel A., 4,426,418, Cl. 428-211.000.

Leszyk, Gerald M.: *See*—
Harasta, Louis P.; Leszyk, Gerald M.; and Morrison, Edward D., 4,426,431, Cl. 430-14.000.

L'Etat Francais, represente par le Secretaire d'Etat aux Postes et des a la Telediffusion (Centre National d'Etudes des Telecommunications): *See*—
Dubost, Gerard; and Vinatier, Claude J., 4,426,649, Cl. 343-700.0MS.

L'Etat Francais, represente par le Secretaire d'Etat aux Postes et Telecommunications (Centre des Telecommunications): *See*—
Pommier, Daniel, 4,426,710, Cl. 375-18.000.

L'Etat Francais, represente par le Secretaire d'Etat aux Postes et Telecommunications et a la Telediffusion (Centre National d'Etudes des Telecommunications): *See*—
Sechet, Claude; Gautier, Christian; and Degoulet, Gabriel, 4,426,684, Cl. 364-900.000.

Levy, Joseph L.: *See*—
Martin, Danny W.; and Levy, Joseph L., 4,426,707, Cl. 372-95.000.

Levy, Paul: *See*—
Chernoff, Edward A.; and Levy, Paul, 4,426,593, Cl. 310-91.000.

Lewis, Jamie B. Splint for use with intravenous line. 4,425,913, Cl. 128-133.000.

Lewis, Richard B.; Julien, Paul C.; Gruber, Robert J.; and Koehler, Richard F., Jr., to Xerox Corporation. Process for positive charge sharing toner compositions. 4,426,436, Cl. 430-137.000.

Leybold Heraeus GmbH: *See*—
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Munz, Wolf-Dieter; and Wolf, Hans, 4,426,264, Cl. 204-192.00R.

Libby, Edwin L.; Maddox, Randall A.; and Roberts, Douglas J., to International Business Machines Corporation. Apparatus for the reduction of image intensity variations in a continuously variable reducing copier. 4,426,153, Cl. 355-3.00R.

Lichtenstein, Joseph: *See*—
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Lienemann, Darlo E.; Ledermann, Donald L.; and Wunschl, Nicholas H., to International Harvester Co. Lock-up mechanism for a planter row unit. 4,425,857, Cl. 111-85.000.

Likhyani, Kewal K., to Du Pont de Nemours, E. I., and Company. Spunlaced fabric containing elastic fibers. 4,426,420, Cl. 428-224.000.
Limper, Nicolaas H.; and Scheffers, Cornelis J. W. M., to U.S. Philips Corporation. Television camera tube. 4,426,599, Cl. 313-389.000.
Lin, Juei-Tse. Method of and apparatus for reinforcing piling structure and improved precast concrete pile suitable for use in said method. 4,426,175, Cl. 405-237.000.
Lindberg, Per. L.: *See*—
Arvidsson, Folke L.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Lindberg, Per. L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Nils U. E.; and Wikstrom, Hakan V., 4,426,386, Cl. 424-267.000.
Linde Aktiengesellschaft: *See*—
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Linder, Ernst: *See*—
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Linder, Seymour M.: *See*—
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Lindner, Christian: *See*—
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Lipid Specialties, Inc.: *See*—
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Lipman, Barry. Electric guitar transducer mounting. 4,425,831, Cl. 84-1.160.
Lippitt, David L.: *See*—
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Liu, Chi S.; Williams, Roy K.; Jasper, Lee R.; and Hensler, Norman A., to United States of America, Navy. Molecular excimer gas UV preionized transverse discharge laser tube assembly. 4,426,706, Cl. 372-86.000.
Livesay, J. D., to General Motors Corporation. Variable displacement axial piston machine. 4,425,837, Cl. 92-71.000.
Livigni, Russell A.: *See*—
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Long, Alvin L. High speed passenger transfer vehicle. 4,425,851, Cl. 104-20.000.
Long, Alvin L. Dropout fuel tanks aircraft. 4,426,050, Cl. 244-135.00R.
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Loov, Robert E.: *See*—
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Louis, Eckhart; Aigner, Ernst; and Hechtl, Wolfgang, to Wacker-Chemie GmbH. Adhesive compositions and method employing same. 4,426,240, Cl. 156-99.000.
Lucas, Andrew A.: *See*—
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Lucas Industries Limited: *See*—
Duesbury, Paul G., 4,425,794, Cl. 73-293.000.
Luchinger, Paul, to Mettler Instrumente AG. Weighing apparatus including calibrating weight operating means. 4,425,975, Cl. 177-50.000.
Lucking, Hans J.: *See*—
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Lugscheider, Walter: *See*—
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Luhman, Thomas; and Suenaga, Masaki, to United States of America, Energy. Multiwire conductor having greatly increased interwire resistance and method for making same. 4,426,550, Cl. 174-128.00R.
Lummen, Hans-Albert: *See*—
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Luomanen, Raymond; and Luomanen, Jack C. Bite-block. 4,425,911, Cl. 128-200.260.
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Luthy, Hans; Isler, Eugen; Meier, Ewald; and Zimmermann, Max, to Egro AG. Low-pressure casting method and low-pressure casting apparatus. 4,425,958, Cl. 164-119.000.
Lyndhurst, Francis R., to Aero Power Engine Manufacturing, Inc. Reciprocating engine air intake system. 4,425,881, Cl. 123-52.0MV.
M.A.N. Maschinenfabrik Augsburg-Nurnberg A.G.: *See*—
Ruter, Franz, 4,426,565, Cl. 219-130.010.
Maass, Gunther; Sattlegger, Hans; and Lucking, Hans J., to Bayer Aktiengesellschaft. Storable crosslinkable organopolysiloxane molding compositions. 4,426,509, Cl. 528-34.000.
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Macewans Machinery Limited: *See*—
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MacFee, Norman W., to Talon, Inc. Method of making slide fastener. 4,426,066, Cl. 264-252.000.
Machida, Bon: *See*—
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Maddox, Randall A.: *See*—
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Madgavkar, Ajay M.: *See*—
Chen, Paul Y.; and Madgavkar, Ajay M., 4,426,280, Cl. 208-254.00R.
Maeda, Hiroshi: *See*—
Suzuki, Toshiyuki; Matsumura, Funiaki; Maeda, Hiroshi; Imai, Akira; and Kurokawa, Nobuo, 4,426,337, Cl. 264-4.000.
Magder, Jules, to Noxso Corporation. Method for removing nitrogen oxides from gas streams and regenerating spent sorbent. 4,426,365, Cl. 423-239.000.
Magnuson, Richard C.: *See*—
Kehl, Norman J.; and Magnuson, Richard C., 4,426,114, Cl. 297-232.000.
Mahmood, Mahmood N.: *See*—
Brown, David E.; and Mahmood, Mahmood N., 4,426,269, Cl. 204-242.000.
Maier, Lawrence C., to Simmonds Precision Products, Inc. Capacitive measurement system. 4,426,616, Cl. 324-57.00R.
Makarov, Jury A.: *See*—
Kiselnikov, Valentin N.; Shubin, Arkady A.; Vyalkov, Vladislav V.; Kruglov, Vitaly A.; Loginova, Tamara F.; Romanov, Viktor S.; Ovchinnikov, Lev N.; Varlamov, Valentin I.; Makarov, Jury A.; Penkov, Evgeny I.; Shvareva, Galina N.; and Shtefan, Vladimir N., 4,426,507, Cl. 526-303.100.
Maki, Masao; Fukuda, Hiroshi; and Sano, Seiichi, to Matsushita Electric Industrial Company, Limited. Coating compositions for solar selective absorption comprising a thermosetting acrylic resin and particles of a low molecular weight fluorocarbon polymer. 4,426,465, Cl. 523-135.000.
Makita, Fujio, to Fuji Jukogyo Kabushiki Kaisha. Systems for preventing overheat of electromagnetic clutch for vehicles. 4,425,992, Cl. 192-82.00T.
Malec, Robert E., to Edwin Cooper, Inc. Lubricating compositions containing boronated nitrogen-containing dispersants. 4,426,305, Cl. 252-49.600.
Malecki, Edmund E.; and Jacobs, Harold, to United States of America, Army. Millimeter wave oscillator with enhanced dielectric coupler. 4,426,628, Cl. 331-96.000.
Malkowski, Joseph L.: *See*—
Wells, Calvin G.; and Malkowski, Joseph L., 4,425,817, Cl. 74-467.000.
Malmqvist, Erik L.; and Kristiansson, Krister, to Boliden Aktiebolag. Method and apparatus for measuring radon in the ground. 4,426,575, Cl. 250-253.000.
Manabe, Nobuyuki; and Goto, Takahiro, to Taiho Industries Co. Ltd.; and O.P.E. Co. Ltd. Method for disposal of sludge in floating roof type oil tank. 4,426,233, Cl. 134-21.000.
Manabe, Seiichi: *See*—
Kuriki, Tomio; and Manabe, Seiichi, 4,426,516, Cl. 528-272.000.

Mandrin, Charles, to Sulzer Brothers Limited. Method for the preparation of deuterium-enriched water in the preparation of hydrogen. 4,426,370, Cl. 423-580.00H.

Mannesmann Rexroth: *See—*
Wusthof, Peter; and Schneider, Johann, 4,426,199, Cl. 418-61.00B.

Manocha, Ajit S.: *See—*
Kravitz, Stanley H.; Manocha, Ajit S.; and Willenbrock, William E., Jr., 4,426,246, Cl. 156-643.000.

Mantelle, Jean: *See—*
Plaquin, Bernard; Bounie, Paul; and Mantelle, Jean, 4,426,105, Cl. 285-92.000.

Manville Service Corporation: *See—*
Parker, William H., 4,425,749, Cl. 52-509.000.

Mar Hook & Equipment, Inc.: *See—*
Mitchell, Johnny D.; and Armstrong, Hugh D., 4,426,110, Cl. 294-88.000.

Marcus, Konrad H., to Prince Corporation. Vehicle magnetic sensor. 4,425,717, Cl. 33-361.000.

Marello, Georges: *See—*
Chenin, Claude; Krawczyk, Rodolphe; Marello, Georges; and Lombard, Jean-Yves, 4,426,053, Cl. 244-173.000.

Marinoni, Mario; and Marinoni, Mirko, to Casma di V. Marinoni & Figli. Valve for adjusting the closing speed of a door closer. 4,425,939, Cl. 137-599.200.

Marinoni, Mirko: *See—*
Marinoni, Mario; and Marinoni, Mirko, 4,425,939, Cl. 137-599.200.

Mark, Victor, to General Electric Company. Polycarbonate resins based on polyphenolic compounds. 4,426,513, Cl. 528-204.000.

Markey Brothers Co.: *See—*
Markey, Dennis P.; and Rosen, George J., 4,425,742, Cl. 52-90.000.

Markey, Dennis P.; and Rosen, George J., to Markey Brothers Co. Building construction and purlin hanger therefor with method of construction. 4,425,742, Cl. 52-90.000.

Marran, John D. Wound boiler with removable and replaceable combustion chamber. 4,425,875, Cl. 122-134.000.

Marschner, Heinz; Heinemann, Fritz; and Marsland, George, to Zahnradfabrik Friedrichshafen AG. Harmonic-drive assembly. 4,425,822, Cl. 74-640.000.

Marshke, Hugh E. Paint spray booth. 4,425,870, Cl. 118-326.000.

Marsland, George: *See—*
Marschner, Heinz; Heinemann, Fritz; and Marsland, George, 4,425,822, Cl. 74-640.000.

Marson Corporation: *See—*
Todisco, Joseph, 4,425,782, Cl. 72-391.000.

Marten, Rainer: *See—*
Schwenke, Joachim; Knoth, Joachim; Marten, Rainer; and Rosomm, Herbert, 4,426,717, Cl. 378-45.000.

Martenas, Wayne B., to Sperry Corporation. Forage harvester drive apparatus. 4,426,043, Cl. 241-101.200.

Martens, Jurgen: *See—*
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,426,532, Cl. 548-344.000.

Martin, Danny W.; and Levy, Joseph L., to McDonnell Douglas Corporation. Single mode cavity laser. 4,426,707, Cl. 372-95.000.

Martin, David H., to International Business Machines Corporation. Electrolytic apparatus having a stable reference electrode and method of operating such apparatus. 4,426,643, Cl. 340-713.000.

Martin, Henry, to Ciba-Geigy Corporation. Oxime carbamates for the protection of cultivated crops. 4,426,221, Cl. 71-105.000.

Martin, John E. Plug assembly for use in method and apparatus for repairing heat exchangers. 4,425,943, Cl. 138-89.000.

Martin, Richard T., to Applied Magnetics Corporation. Apparatus for sensing deposition of a thin film layer of a material. 4,425,871, Cl. 118-664.000.

Marvin Glass & Associates: *See—*
Kulesza, Ralph J.; and Disko, Harry, 4,425,735, Cl. 46-202.000.

Marzola, Roberto; Garagnani, Enea; and Moro, Alessandro, to Montedison S.p.A. Glass fibers for the reinforcement of polyolefins and reinforced polyolefin compositions obtained therefrom. 4,426,469, Cl. 523-209.000.

Masafumi, Ohta: *See—*
Hashimoto, Mitsuru; Masafumi, Ohta; Kozima, Akio; Sakai, Kiyoshi; and Sasaki, Masaomi, 4,426,327, Cl. 260-160.000.

Masao, Morimoto, to Sanyo Electric Co., Ltd. Blower. 4,425,840, Cl. 98-40.00V.

Maselli, James M.: *See—*
Ernest, Michael V.; and Maselli, James M., 4,426,320, Cl. 502-313.000.

Masher, Dale P.; and Chaitin, Leonard J., to Savin Corporation. Pulse width modulation system. 4,426,667, Cl. 360-44.000.

Mashimo, Yukio: *See—*
Iura, Yukio; Yamamichi, Masayoshi; Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 4,426,142, Cl. 354-412.000.

Maslanka, William W.; and Spence, Gavin G., to Hercules Incorporated. Organic pigments. 4,426,483, Cl. 524-460.000.

Mason, Donald G.; and Weis, Frank G., to Smith & Loveless, Inc. Method and apparatus for removing oil from water. 4,426,293, Cl. 210-636.000.

Mason, James R. Police restraint device. 4,426,079, Cl. 273-84.00R.

Mason, Matthew T.: *See—*
Larson, Noble G.; Purbrick, John A.; and Mason, Matthew T., 4,426,608, Cl. 318-685.000.

Mason, Michael P.; and Scaran, Robert R., to Cap Cutters, Inc. Roofing cap cutter. 4,425,710, Cl. 30-229.000.

Massachusetts Institute of Technology: *See—*
Gorski-Popiel, George, 4,426,712, Cl. 375-96.000.

Larson, Noble G.; Purbrick, John A.; and Mason, Matthew T., 4,426,608, Cl. 318-685.000.

Massey-Ferguson Inc.: *See—*
Dwyer, Robert M.; and Skiba, Edwin J., 4,425,970, Cl. 172-7.000.

Mastergear Company Limited: *See—*
Norton, Colin F.; and Harvey, Raymond G., 4,425,815, Cl. 74-425.000.

Masuda, Toru: *See—*
Tanaka, Masanori; Takihara, Yukio; and Masuda, Toru, 4,426,558, Cl. 200-51.090.

Masuda, Yoshinori: *See—*
Yoshida, Mitsuo; Masuda, Yoshinori; and Kashiwada, Akio, 4,426,271, Cl. 204-296.000.

Masumoto, Hiroki: *See—*
Sugino, Kazuo; Kageyama, Hideaki; and Masumoto, Hiroki, 4,426,236, Cl. 148-36.000.

Masuoka, Fujio, to Tokyo Shibaura Denki Kabushiki Kaisha; and Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,426,687, Cl. 365-182.000.

Matheney, Jack L.: *See—*
Willis, Albert E.; Gould, John M.; Matheney, Jack L.; and Garrett, Harrison, 4,426,678, Cl. 363-25.000.

Matsuda, Hiroshi: *See—*
Yamashita, Shigeo; Matsuda, Hiroshi; Kobayashi, Uichiroo; Kobayashi, Masayoshi; and Nakashima, Hisao, 4,426,702, Cl. 372-45.000.

Matsuda, Yoshio: *See—*
Akashi, Shunji; and Matsuda, Yoshio, 4,425,684, Cl. 24-434.000.

Matsui, Yoshiya: *See—*
Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; Moriwaki, Masazumi; Mochizuki, Noritaka; Minami, Setsuo; and Matsui, Yoshiya, 4,426,132, Cl. 350-167.000.

Matsumoto, Hiroshi; and Ogura, Tomoki, to Tokyo Shibaura Denki Kabushiki Kaisha. Copying machine with automatic document feeder. 4,426,150, Cl. 355-14.0SH.

Matsumura, Funiaki: *See—*
Suzuki, Toshiyuki; Matsumura, Funiaki; Maeda, Hiroshi; Imai, Akira; and Kurokawa, Nobuo, 4,426,337, Cl. 264-4.000.

Matsumura, Hiroyoshi; Katsuyama, Toshio; and Suganuma, Tsuneo, to Hitachi, Ltd. Optical fiber and method of producing the same. 4,426,129, Cl. 350-96.330.

Matsumura, Rumiko, legal representative: *See—*
Matsumura, Shingo, deceased; Kise, Masahiro; Ozaki, Masakuni; Tada, Shinichi; Kazuno, Kenji; Watanabe, Hisao; Kunimoto, Katsutoshi; and Tsuda, Masami, 4,426,381, Cl. 424-250.000.

Matsumura, Shingo, deceased (by Matsumura, Rumiko, legal representative); Kise, Masahiro; Ozaki, Masakuni; Tada, Shinichi; Kazuno, Kenji; Watanabe, Hisao; Kunimoto, Katsutoshi; and Tsuda, Masami, to Nippon Shinyaku Co., Ltd. Carboxylic acid derivatives. 4,426,381, Cl. 424-250.000.

Matsunawa, Masahiko: *See—*
Tarun., Noriyoshi; Iwahashi, Haruo; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,426,654, Cl. 346-159.000.

Matsuo, Masashi: *See—*
Yoshida, Shuzo; Ono, Hironobu; Matsuo, Masashi; Hoshi, Kouich; Sueishi, Motoharu; and Ueda, Kazuo, 4,425,895, Cl. 123-489.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hikino, Tadashi; Kobayashi, Ikuo; and Nagai, Takeshi, 4,426,570, Cl. 219-354.000.
Hotta, Shu; Hosaka, Tomiharu; Shimotsuma, Wataru; and Kishimoto, Yoshio, 4,426,546, Cl. 136-256.000.
Kobayashi, Masaaki; and Kohda, Minoru, 4,426,666, Cl. 360-10.300.
Kobayashi, Masaaki; and Kohda, Minoru, 4,426,666, Cl. 360-10.300.
Maki, Masao; Fukuda, Hiroshi; and Sano, Seiichi, 4,426,465, Cl. 523-135.000.
Saiki, Shuji; Sato, Katuaki; Sato, Kazue; Ishikawa, Seiichi; Inoue, Hideaki; and Tanaka, Tsuneo, 4,426,556, Cl. 179-115.5DV.
Satoh, Isao; Yoshida, Tomio; Harigae, Shunji; and Koishi, Kenji, 4,426,693, Cl. 369-45.000.
Takahashi, Ken; and Youda, Hiroshi, 4,425,701, Cl. 29-603.000.
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Matsuura, Hitoshi: *See—*
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Matsuura, Miyuki: *See—*
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Matsuyama, Iwao: *See—*
Satoh, Shin; Susa, Kenzo; Matsuyama, Iwao; and Suganuma, Tsuneo, 4,426,216, Cl. 65-18.100.

Matz, James: *See—*
Cohen, Theodore; and Matz, James, 4,426,535, Cl. 549-397.000.

Mauleon, Jean-Louis: *See—*
Dean, Robert R.; and Mauleon, Jean-Louis, 4,426,276, Cl. 208-60.000.

Maxner, Richard B.; and Bandura, Vitaly, to USM Corporation. Single point cut and clench mechanism. 4,425,947, Cl. 140-105.000.

Maynard, Walter P., Jr. Pouring spout for liquid containers. 4,426,027, Cl. 222-529.000.

McBride, Paul: *See—*
Good, Raymond H.; and McBride, Paul, 4,426,425, Cl. 428-414.000.

McCandlish, Larry E.; and Turaew, Larissa W., to Exxon Research and Engineering Co. Novel molybdenum oxycarbonitride compositions. 4,426,366, Cl. 423-365.000.

McCarty, Robert S.: *See*—
McJones, Robert W.; McCarty, Robert S.; and Cardillo, Joseph S., 4,425,893, Cl. 123-446.000.

McClure, Leon E.; and McClure, Stanley R., Sr. Herbicide applicator and welded endless rope. 4,425,736, Cl. 47-1.500.

McClure, Stanley R., Sr.: *See*—
McClure, Leon E.; and McClure, Stanley R., Sr., 4,425,736, Cl. 47-1.500.

McCoy, David R.; Gipson, Robert M.; and Naylor, Carter G., to Texaco Inc. Oil recovery method utilizing a dicyclopentadiene derived ethoxysulfonate. 4,426,302, Cl. 252-8.55D.

McCoy, James B. Pipe coupling. 4,426,106, Cl. 285-236.000.

McDonald, Ronald T. Thread guard. 4,425,945, Cl. 138-96.00T.

McDonnell Douglas Corporation: *See*—
Martin, Danny W.; and Levy, Joseph L., 4,426,707, Cl. 372-95.000.

McGinley Mills, Inc.: *See*—
McGinley, Thomas F., 4,425,946, Cl. 139-11.000.

McGinley, Thomas F., to McGinley Mills, Inc., a part interest. Weaving method and apparatus. 4,425,946, Cl. 139-11.000.

McGlew, Timothy E.: *See*—
Rizzutto, Junko; and McGlew, Timothy E., 4,425,679, Cl. 24-6.000.

McGregor, Jon D. C.; and Richards, Deanna E. Cash safe. 4,425,853, Cl. 109-25.000.

McGuire, Raymond R.: *See*—
Shackelford, Scott A.; McGuire, Raymond R.; and Cochoy, Robert E., 4,426,540, Cl. 568-590.000.

McJones, Robert W.; McCarty, Robert S.; and Cardillo, Joseph S., to Garrett Corporation, The. Fuel injection. 4,425,893, Cl. 123-446.000.

McLean, Kerry L. Gaseous fuel-air mixture device. 4,425,898, Cl. 123-527.000.

McMorrow, Richard H., Jr.: *See*—
Neumann, Leopold; Kline, Richard B., II; and McMorrow, Richard H., Jr., 4,426,644, Cl. 340-720.000.

McQuay Inc.: *See*—
Johnson, Walter T.; and Gross, Nelson B., 4,426,120, Cl. 312-100.000.

Mecan ARBED s.a r.l.: *See*—
Reuter, Hans J.; Take, Hermann; and Werner, Charles, 4,425,960, Cl. 164-426.000.

Meckel, Benjamin B.; and Meckel, Nathan K., to Deposition Technology, Inc. Sputtering device adaptable for coating heat-sensitive substrates. 4,426,275, Cl. 204-298.000.

Meckel, Nathan K.: *See*—
Meckel, Benjamin B.; and Meckel, Nathan K., 4,426,275, Cl. 204-298.000.

Meienhofer, Johannes A., to Hoffmann-La Roche Inc. Immunopotentiating peptides. 4,426,324, Cl. 260-112.50R.

Meier, Ewald: *See*—
Luthy, Hans; Isler, Eugen; Meier, Ewald; and Zimmermann, Max, 4,425,958, Cl. 164-119.000.

Meiller, Hermann. Seat having an adjustable backrest. 4,425,910, Cl. 128-52.000.

Meitner, Gary H.; and Hotchkiss, Harry W., to Kimberly-Clark Corporation. Nonwoven wiper. 4,426,417, Cl. 428-195.000.

Melvin, George E.: *See*—
Kranik, John R.; Melvin, George E.; and Mueller, Wolfgang F., 4,425,829, Cl. 83-62.100.

Memorial Hospital for Cancer and Allied Diseases: *See*—
Ray, Cole; Vincent, John; and Small, Clifford, 4,425,914, Cl. 128-200.140.

Menasha Corporation: *See*—
Riviere, Donald L., 4,425,852, Cl. 108-56.300.

Menet, Francis: *See*—
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Mentani, Akiyoshi; and Nakamoto, Hiromasa. Steering lock assembly. 4,425,770, Cl. 70-252.000.

Merck & Co., Inc.: *See*—
Alexander, Jose; and Shih, Chung, 4,426,391, Cl. 424-301.000.
Woltersdorf, Otto W., Jr., 4,426,388, Cl. 424-270.000.

Messerschmitt-Bolkow-Blohm G.m.b.H.: *See*—
Grossler, Peter, 4,425,850, Cl. 102-307.000.

Metal Box Limited: *See*—
Franek, Josef T.; and Porucznik, Paul, 4,425,778, Cl. 72-347.000.

Metrailer, William J., to Exxon Research and Engineering Co. Low severity fluid coking process. 4,426,277, Cl. 208-127.000.

Mettler Instrumente AG: *See*—
Luchinger, Paul, 4,425,975, Cl. 177-50.000.

Metzger, Fridolin: *See*—
Ilar, Franc; and Metzger, Fridolin, 4,426,670, Cl. 361-79.000.

Meyers, Robert A.; and Hart, Walter D., to TRW Inc. Float/sink treatment of crushed coal in solutions of monosaccharides and disaccharides. 4,426,281, Cl. 209-11.000.

Michaels, William A.: *See*—
Updike, Stanley H.; Michaels, William A.; and Kuonen, Frederick L., 4,425,882, Cl. 123-90.300.

Michel, Benjamin F. Trucking simulation game. 4,426,084, Cl. 273-254.000.

Michiuchi, Masayuki, to Honda Giken Kogyo Kabushiki Kaisha. Air cleaner system for motorcycle engine. 4,425,977, Cl. 180-225.000.

Middleburg Steel and Alloys (Proprietary) Limited: *See*—
Curr, Thomas R.; and Barcza, Nicholas A., 4,426,223, Cl. 75-10.00R.

Midorikawa, Koyo: *See*—
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Mikelsons, Valdis: *See*—
Fisch, Richard S.; and Mikelsons, Valdis, 4,426,437, Cl. 430-166.000.

Mildren, Michael T., to Commonwealth of Australia, The. Stabilizing a rotating body. 4,426,048, Cl. 244-3.230.

Miler, Jane: *See*—
Brooks, Mark A.; and Miler, Jane, 4,426,406, Cl. 427-58.000.

Miles, Ronald N., to Boeing Company, The. Beam dampers for damping the vibrations of the skin of reinforced structures. 4,425,980, Cl. 181-208.000.

Miller, Mark C.; and Arthur, John R., to Perkin-Elmer Corporation, The. Temperature sensor assembly. 4,426,569, Cl. 219-272.000.

Millet, Claude: *See*—
Dromard, Adrien; and Millet, Claude, 4,426,508, Cl. 528-23.000.

Mills, Geoffrey S. Milking inflations. 4,425,872, Cl. 119-14.470.

Minami, Setsuo: *See*—
Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; Moriwaki, Masazumi; Mochizuki, Noritaka; Minami, Setsuo; and Matsui, Yoshiya, 4,426,132, Cl. 350-167.000.

Minamizono, Junji; Hirano, Mitunori; Kawashima, Yoshiro; and Ogawa, Tadashi, to Fuji Photo Film, Co., Ltd. Silver halide photographic light-sensitive material. 4,426,445, Cl. 430-599.000.

Minchak, Robert J., to B. F. Goodrich Company, The. Bulk polymerization of cycloolefins. 4,426,502, Cl. 526-172.000.

Minegishi, Sokichi; Takizawa, Tozo; and Furusawa, Morimasa, to Jidosha Kiki Co., Ltd. Glow plug for use in diesel engine and method of manufacturing the same. 4,425,692, Cl. 29-611.000.

Mineral Processing Systems, Inc.: *See*—
Hively, Eugene E., 4,426,042, Cl. 241-21.000.

Minezaki, Shigehiro: *See*—
Funada, Fumiaki; Minezaki, Shigehiro; Kozaki, Syuichi; and Uede, Hisashi, 4,426,133, Cl. 350-334.000.

Ministry of International Trade and Industry: *See*—
Shinozaki, Kichitaro; Sato, Kiyoshi; and Shimizu, Toru, 4,425,774, Cl. 72-257.000.

Minnesota Mining and Manufacturing Company: *See*—
Bradford, Robert S.; Brookhart, Marshall R.; and Dy, Bennett G., 4,426,665, Cl. 360-10.200.
Chang, John C. C., 4,426,476, Cl. 524-288.000.
Fisch, Richard S.; and Mikelsons, Valdis, 4,426,437, Cl. 430-166.000.
Schwartz, Craig A., 4,426,466, Cl. 523-455.000.

Minns, Richard A., to Polaroid Corporation. Polymers containing decahalopentacyclodecyl groups. 4,426,505, Cl. 526-283.000.

Minolta Camera Kabushiki Kaisha: *See*—
Kohri, Toshitaro; Kato, Hitoshi; and Ito, Noboru, 4,426,433, Cl. 430-109.000.

Miroshnichenko, Anatoly G.: *See*—
Berzin, Evgeny K.; Miroshnichenko, Anatoly G.; and Yantovsky, Leonid I., 4,426,592, Cl. 310-52.000.

Mitchell, Johnny D.; and Armstrong, Hugh D., to Mar Hook & Equipment, Inc. Continuous rotation hydraulic grapple. 4,426,110, Cl. 294-88.000.

Mitchell, Samuel S.; and Vijlee, Abbas F., to Schroeder Brothers Corporation. Filter condition indicator. 4,426,284, Cl. 210-90.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Horii, Taichi; Horii, Taro; and Haraguchi, Kazuo, 4,426,006, Cl. 209-593.000.

Miura, Kiyoshi: *See*—
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Miyaji, Shinichiro: *See*—
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Miyakoshi, Hideo: *See*—
Aoki, Tadao; Miyakoshi, Hideo; and Mizukoshi, Mikio, 4,426,454, Cl. 436-504.000.

Miyamae, Toshiaki. Fishing rod holder fixing means. 4,425,729, Cl. 43-21.200.

Miyamoto, Seigo: *See*—
Fukushima, Toshihiko; Miyamoto, Seigo; Kawashima, Kenichi; Kawabata, Toshiaki; Tani, Seijiro; and Shibata, Takanori, 4,425,765, Cl. 62-133.000.

Miyazaki, Makoto; Nomura, Takeshi; Imai, Chihiro; and Yoda, Makoto, to Toa Nenryo Kogyo Kabushiki Kaisha. Magnesium-containing solid. 4,426,314, Cl. 502-169.000.

Mizokami, Kazunori, to Olympus Optical Company, Ltd. Overexposure indicator for an automatic electronic flash. 4,426,143, Cl. 354-416.000.

Mizuhara, Howard, to GTE Products Corporation. Ductile titanium-copper brazing alloy. 4,426,033, Cl. 228-56.000.

Mizukoshi, Mikio: *See*—
Aoki, Tadao; Miyakoshi, Hideo; and Mizukoshi, Mikio, 4,426,454, Cl. 436-504.000.

Mizuma, Kenichi, to Ricoh Company, Ltd. Apparatus for aligning a paper sheet with a reference line. 4,426,073, Cl. 271-251.000.

Mizuno, Masamitsu; Itoh, Kazuomi; and Urushibara, Masahiro, to Hokuetsu Industries Co., Ltd. Control system for a self-excited alternating current generator. 4,426,613, Cl. 322-21.000.

Mizuta, Ken: *See*—
Kondo, Shiro; and Mizuta, Ken, 4,426,559, Cl. 200-67.0DB.

Moba? Chemical Corporation: *See*—
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Mobil Oil Corporation: *See*—
Hungerford, Gordon P., 4,426,486, Cl. 524-600.000.

Ong, S. Christine; and Bright, Margaret N., 4,426,346, Cl. 264-290.200.

Mochizuki, Noritaka: *See*—
Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; Moriwaki, Masazumi; Mochizuki, Noritaka; Minami, Setsuo; and Matsui, Yoshiya, 4,426,132, Cl. 350-167.000.

Mock, Elmar: *See*—
Muller, Jacques; and Mock, Elmar, 4,426,158, Cl. 368-76.000.

Moder, Helmut, to Robert Bosch GmbH. Low-loss semiconductor switching circuit. 4,426,589, Cl. 307-254.000.

Mogi, Kazuo: *See*—
Suita, Muneo; and Mogi, Kazuo, 4,426,606, Cl. 318-375.000.

Mohsin, Mohamed E., to National Research Development Corporation. Fluid bearings. 4,426,118, Cl. 308-5.00R.

Molenaar, Arian; and Wierenga, Peter E., to U.S. Philips Corporation. Method of producing metal images or patterns on and/or below the surface of a substrate comprising a semiconducting light-sensitive compound. 4,426,442, Cl. 430-413.000.

Moll, Hermann; Leist, Helmut J.; Pomorin, Karl-Heinz; and Ullrich, Georg J., to Hellige GmbH. Membrane retainer arrangement for physiological sensing units. 4,425,918, Cl. 128-635.000.

Mollet, Adrianus J. T.; and Sanders, Rudolf, to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp. 4,426,602, Cl. 315-58.000.

Monchalin, Jean-Pierre. Method and apparatus for the interferometric wavelength measurement of frequency tunable C.W. lasers. 4,426,155, Cl. 356-346.000.

Mondet, Jean: *See*—
Jacquet, Bernard; Papantoniou, Christos; and Mondet, Jean, 4,426,375, Cl. 424-70.000.

Monks, Reginald: *See*—
Cree, Gavin M.; Wilkins, Terence A.; Monks, Reginald; and Nowotnik, David P., 4,426,453, Cl. 436-500.000.

Monsanto Company: *See*—
Barker, George E.; and Forster, Denis, 4,426,542, Cl. 568-883.000.
Schumacher, Ignatius; and Wang, Kang-Bo, 4,426,543, Cl. 568-940.000.

Monsion, Michel: *See*—
Bousseau, Gerard; Baylou, Pierre; Mora, Andre; Monsion, Michel; and Bouvet, Christian, 4,425,751, Cl. 56-327.00A.

Montedison S.p.A.: *See*—
Marzola, Roberto; Garagnani, Enea; and Moro, Alessandro, 4,426,469, Cl. 523-209.000.
Troiani, Nicola; Gozzo, Franco; and Lorusso, Simone, 4,426,393, Cl. 424-327.000.
Vittone, Andrea; and Furia, Edoardo, 4,426,343, Cl. 264-147.000.

Moore, Reginald C.: *See*—
Becconsall, Jack K.; Cramp, John H. W.; Reid, Robert F.; Moore, Reginald C.; Rye, Barry J.; and Thomas, Eric L., 4,426,640, Cl. 340-632.000.

Moplefan S.p.A.: *See*—
Vittone, Andrea; and Furia, Edoardo, 4,426,343, Cl. 264-147.000.

Mora, Andre: *See*—
Bousseau, Gerard; Baylou, Pierre; Mora, Andre; Monsion, Michel; and Bouvet, Christian, 4,425,751, Cl. 56-327.00A.

Mori, Ikuo, to Nippon Kogaku K.K. Gauss type photographic lens. 4,426,137, Cl. 350-471.000.

Mori, Kei. Sunlight collecting and concentrating apparatus. 4,425,905, Cl. 126-425.000.

Mori, Keiji, to Aisin Seiki Kabushiki Kaisha. Sliding roof for vehicles. 4,426,112, Cl. 296-223.000.

Mori, Masaharu, to Clarion Co., Ltd. Receiver having a surface elastic wave high frequency amplifier with a frequency-controlled pump oscillator. 4,426,732, Cl. 455-263.000.

Mori, Masaharu, to Clarion Co., Ltd. Circuit for generating a pumping signal for a surface elastic wave parametric device in a receiver. 4,426,737, Cl. 455-260.000.

Mori, Takao: *See*—
Hirao, Motohisa; Doi, Atsutoshi; Nakamura, Michiharu; Tsuji, Shinji; and Mori, Takao, 4,426,700, Cl. 372-45.000.

Moriki, Takeo; and Fukumitsu, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Disc reproducing apparatus. 4,426,695, Cl. 369-77.200.

Morin, Francois; Favennec, Jean-Luc; and Bonnel, Madeleine. Process for producing thin-film transistors on an insulating substrate. 4,426,407, Cl. 427-86.000.

Morishita Jintan Company, Limited: *See*—
Suzuki, Toshiyuki; Matsumura, Funiaki; Maeda, Hiroshi; Imai, Akira; and Kurokawa, Nobuo, 4,426,337, Cl. 264-4.000.

Morita, Masao: *See*—
Tamamura, Toshiaki; Imamura, Saburo; Morita, Masao; and Kogure, Osamu, 4,426,247, Cl. 156-643.000.

Moriwaki, Masazumi: *See*—
Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; Moriwaki, Masazumi; Mochizuki, Noritaka; Minami, Setsuo; and Matsui, Yoshiya, 4,426,132, Cl. 350-167.000.

Moriya, Shigeru: *See*—
Katsuno, Mitsuaki; and Moriya, Shigeru, 4,426,102, Cl. 280-804.000.

Moro, Alessandro: *See*—
Marzola, Roberto; Garagnani, Enea; and Moro, Alessandro, 4,426,469, Cl. 523-209.000.

Morooka, Yasuo: *See*—
Kurihara, Nobuo; Morooka, Yasuo; Nishikawa, Mitsuyo; Miura, Kiyoshi; and Nagahashi, Yoshitoshi, 4,426,641, Cl. 340-683.000.

Morris, Albert E. Tool for removing lids from tins. 4,425,826, Cl. 81-3.360.

Morrison, David J., to Crusher Corporation. Strength testing game system using a can. 4,425,797, Cl. 73-379.000.

Morrison, Edward D.: *See*—
Harasta, Louis P.; Leszyk, Gerald M.; and Morrison, Edward D., 4,426,431, Cl. 430-14.000.

Mort, Edgar A. Vacuum mounting support for a roof truss forming machine. 4,426,059, Cl. 248-637.000.

Morton, Anthony J.; and Harvey, Kenneth, to Colgate-Palmolive Co. Smooth dental cream. 4,426,373, Cl. 424-52.000.

Moser, Winfried: *See*—
Franke, Horst; Linder, Ernst; Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,425,788, Cl. 73-35.000.

Motor Wheel Corporation: *See*—
Ogren, Robert S., 4,425,954, Cl. 157-1.220.

Motorola, Inc.: *See*—
D'Avello, Robert F.; and Sokola, Raymond L., 4,426,631, Cl. 333-202.000.

Motors & Armatures, Inc.: *See*—
Chernoff, Edward A.; and Levy, Paul, 4,426,593, Cl. 310-91.000.

Motoyama, Tadashi, to Sony Corporation; and Sony Corporation. Optical reproducing device having focus servo system. 4,426,690, Cl. 369-45.000.

Mottate, Tatsuo, to Nippon Thompson Co., Ltd. Ball bearing slide unit for linear motion. 4,426,119, Cl. 308-6.00C.

Mount, Bruce E.; and Rader, Con D., to Perkin-Elmer Corp., The. Ultrasonic air flow transducer for high humidity environments. 4,425,804, Cl. 73-861.280.

Moustakas, Matthew A.; and Olejkowski, Edwin, to Freelance, Inc. Combination switch plate and photograph holder. 4,425,725, Cl. 40-152.000.

Moxley, David C., to NCR Corporation. Memory system having an alternate memory. 4,426,688, Cl. 365-200.000.

Mueller, Franz: *See*—
Fischer, Kurt; and Mueller, Franz, 4,425,957, Cl. 164-37.000.

Mueller, Wolfgang F.: *See*—
Kranik, John R.; Melvin, George E.; and Mueller, Wolfgang F., 4,425,829, Cl. 83-62.100.

Muellner, William C.; and Hvostik, Walter, to Perkin-Elmer Corporation, The. Strip chart recorder. 4,426,651, Cl. 346-136.000.

Muether, Manfred; and Behne, Ernest-August, to Siemens Aktiengesellschaft. Dental X-ray diagnostic installation. 4,426,716, Cl. 378-38.000.

Muhlberger, Horst. Welding alloy and method. 4,426,426, Cl. 428-682.000.

Muller, Jacques; and Mock, Elmar, to ETA S.A., Fabriques d'Ebauches. Analog-display electronic watch with stator mounted rotor, hand spindles and gear train. 4,426,158, Cl. 368-76.000.

Muller, Klaus: *See*—
Franke, Horst; Linder, Ernst; Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,425,788, Cl. 73-35.000.

Muller, Rolf: *See*—
Doemen, Benno; and Muller, Rolf, 4,426,604, Cl. 318-334.000.

Muller, Sylvio. Rolling pin apparatus. 4,426,200, Cl. 425-101.000.

Multi-Elmac Company: *See*—
Apple, William C.; and Jacob, Keith D., 4,426,637, Cl. 340-825.650.

Munchener Apparatebau Fur Elektronische Gerate Kimmel GmbH & Co. KG: *See*—
Kreiner, Hans-Jurg; Seif, Rudolf; and Zimmer, Wilhelm, 4,426,581, Cl. 250-380.000.

Munte, Harm-Hinrich, to Jastram-Werke GmbH & Co. KG. Method and apparatus for conveying and damming back lighter liquids floating on specifically heavier liquids, particularly oil floating on water. 4,426,288, Cl. 210-242.300.

Munz, Wolf D.; and Hessberger, Gerhard, to Leybold Heraeus GmbH. Process and apparatus for the coating of shaped articles by cathode sputtering. 4,426,267, Cl. 204-192.00R.

Munz, Wolf-Dieter; and Wolf, Hans, to Leybold Heraeus GmbH. Method and means for controlling sputtering apparatus. 4,426,264, Cl. 204-192.00R.

Murakami, Hiromi; Suzuki, Masato; and Suzuki, Tutomu, to Toko, Inc. Methods of fabricating a miniature high frequency coil assembly or transformer. 4,425,702, Cl. 29-606.000.

Murase, Hidetoshi: *See*—
Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; Moriwaki, Masazumi; Mochizuki, Noritaka; Minami, Setsuo; and Matsui, Yoshiya, 4,426,132, Cl. 350-167.000.

Murase, Kenji: *See*—
Yamaguchi, Hisashi; Kawada, Toyoshi; Kashiwara, Hirofumi; Ishizaki, Hiroyuki; and Murase, Kenji, 4,426,646, Cl. 340-769.000.

Murayama, Fumiaki, to Nippondenso Co., Ltd. Fuel injection advance apparatus. 4,425,896, Cl. 123-501.000.

Murphy, Kent A., to International Telephone and Telegraph Corporation. Method of fabricating a low loss fused biconical taper fiber optic coupler. 4,426,215, Cl. 65-4.210.

Murphy, Lynn M. R.: *See*—
Lee, Richard J.; and Murphy, Lynn M. R., 4,426,306, Cl. 252-51.50A.

Musick, Stuart I.: *See*—
Olson, Ralph B.; and Musick, Stuart I., 4,426,008, Cl. 211-49.00D.

Mustoe, Edward H., to Wide-Lite International Corporation. HPS Starting aid. 4,426,603, Cl. 315-289.000.

Myers, Herbert: *See*—
Langley, Robert C.; and Myers, Herbert, 4,426,262, Cl. 204-98.000.

Myrens Verksted A/S: *See*—
Johnsen, Oystein, 4,426,256, Cl. 162-237.000.

Nagahashi, Yoshitoshi: *See*—
Kurihara, Nobuo; Morooka, Yasuo; Nishikawa, Mitsuyo; Miura, Kiyoshi; and Nagahashi, Yoshitoshi, 4,426,641, Cl. 340-683.000.

Nagai, Haruo; Noguchi, Yoshio; and Takahei, Kenichiro, to Nippon Telegraph & Telephone Public Corporation. Semiconsductor laser with two active layers. 4,426,704, Cl. 372-50.000.

Nagai, Isao; and Wada, Kenzo, to Kawasaki Steel Corporation. Apparatus for diagnosing abnormalities in rotating machines. 4,425,798, Cl. 73-659.000.

Nagai, Takeshi: *See*—
Hikino, Tadashi; Kobayashi, Ikuo; and Nagai, Takeshi, 4,426,570, Cl. 219-354.000.

Nagashima, Atsushi: *See*—
Ukena, Toshimichi; Narumi, Hiroshi; Shimizu, Takao; and Nagashima, Atsushi, 4,426,266, Cl. 204-206.000.

Nagati, Rashed N., to Pennsylvania Engineering Corporation. Metalurgical vessel suspension system. 4,426,069, Cl. 266-246.000.

Naggar, Rolando, to Canron Inc. Rail-mounted ballast regulator machine. 4,425,969, Cl. 171-16.000.

Nagumo, Fumio; and Takeshita, Kaneyoshi, to Sony Corporation. Solid state image sensor. 4,426,664, Cl. 358-213.000.

Nagy, Bela G.; and Saab, Alfredo H., to Sprague Electric Company. Power factor controller. 4,426,609, Cl. 318-729.000.

Nair, Kumaran M., to Du Pont de Nemours, E. I., and Company. Method for making capacitors with noble metal electrodes. 4,426,356, Cl. 419-21.000.

Nakamae, Kenji; and Shima, Tsukasa, to Asahi Kasei Kogyo Kabushiki Kaisha. Multilayer composite sheet useful as a substrate for artificial leather. 4,426,421, Cl. 428-234.000.

Nakamoto, Hiromasa: *See*—
Mentani, Akiyoshi; and Nakamoto, Hiromasa, 4,425,770, Cl. 70-252.000.

Nakamura, Hiroya: *See*—
Sakai, Yuki; and Nakamura, Hiroya, 4,426,645, Cl. 340-724.000.

Nakamura, Michiharu: *See*—
Hirao, Motohisa; Doi, Atsutoshi; Nakamura, Michiharu; Tsuji, Shinji; and Mori, Takao, 4,426,700, Cl. 372-45.000.

Nakamura, Takaharu: *See*—
Sugimoto, Hachiro; Nakamura, Takaharu; Hamazo, Sachiyuki; Igarashi, Toshiji; and Daiku, Yoshiharu, 4,426,383, Cl. 424-253.000.

Nakamura, Tetsuya: *See*—
Hachitani, Shuji; Tanaka, Yasushi; Ogiso, Haruhiko; and Nakamura, Tetsuya, 4,425,889, Cl. 123-357.000.

Nakano, Motoo: *See*—
Sasaki, Nobuo; and Nakano, Motoo, 4,425,700, Cl. 29-571.000.

Nakase, Toshiaki: *See*—
Yasumatsu, Toshihito; Nakase, Toshiaki; Kubozuka, Toshinori; and Kawabata, Kaoru, 4,426,477, Cl. 524-306.000.

Nakashima, Hisao: *See*—
Yamashita, Shigeo; Matsuda, Hiroshi; Kobayashi, Uichiroo; Kobayashi, Masayoshi; and Nakashima, Hisao, 4,426,702, Cl. 372-45.000.

Nakazawa, Hideaki: *See*—
Kuramoto, Kenichi; and Nakazawa, Hideaki, 4,426,482, Cl. 524-460.000.

Nalco Chemical Company: *See*—
Roe, William J., 4,426,409, Cl. 427-221.000.

Namiki, Hiroo: *See*—
Shirakura, Sachiko; and Namiki, Hiroo, 4,426,376, Cl. 424-71.000.

Nandi, Uma S., to Battelle Development Corporation. Flexible dicyclopentenyl oxyethyl methacrylate curable compositions. 4,426,504, Cl. 526-282.000.

Narumi, Hiroshi: *See*—
Ukena, Toshimichi; Narumi, Hiroshi; Shimizu, Takao; and Nagashima, Atsushi, 4,426,266, Cl. 204-206.000.

Narumiya, Tsuneaki, to Bridgestone Tire Co., Ltd. Molten metal filtering device. 4,426,287, Cl. 210-184.000.

National d'Etudes and Etablissement Publie de Diffusion dit "Telediffusion de France": *See*—
Pommier, Daniel, 4,426,710, Cl. 375-18.000.

National Research Development Corporation: *See*—
Mohsin, Mohamed E., 4,426,118, Cl. 308-5.00R.

Natwig, Gary S., to High Voltage Engineering Corporation. Track and erosion resistant electrical insulation comprising zinc borate and ethylene polymer. 4,426,549, Cl. 174-110.0PM.

Naylor, Carter G.: *See*—
McCoy, David R.; Gipson, Robert M.; and Naylor, Carter G., 4,426,302, Cl. 252-8.55D.

NCR Corporation: *See*—
Moxley, David C., 4,426,688, Cl. 365-200.000.

Negi, Virendra S.: *See*—
Tague, Steven A.; and Negi, Virendra S., 4,426,680, Cl. 364-200.000.

Nehmiz, Peter: *See*—
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; and Nehmiz, Peter, 4,426,584, Cl. 250-492.200.

Neidleman, Saul L.: *See*—
Geigert, John; and Neidleman, Saul L., 4,426,449, Cl. 435-155.000.

Nelken, Ewald. Electrical combustion toilet. 4,425,671, Cl. 4-111.300.

Nelson, Kenneth L., to King-Seeley Thermos Co. Solar collector-type heat transfer apparatus. 4,425,964, Cl. 165-171.000.

Nelson, Paul E.: *See*—
Ida, Noble; Nelson, Paul E.; Haugen, Peter N.; Aho, Robert T.; and Lucas, Andrew A., 4,426,251, Cl. 156-656.000.

Neuhaus, Gunter: *See*—
Blattermann, Karl-Gunther; Neuhaus, Gunter; and Nolte, Guther, 4,425,995, Cl. 198-605.000.

Neumann, Leopold; Kline, Richard B., II; and McMorrow, Richard H., Jr., to Siemens AG. Method and apparatus for generating three coordinate signals x, y, z for an x, y, z display device. 4,426,644, Cl. 340-720.000.

Neuzil, Richard W.; and Fergin, Richard L., to UOP Inc. Extraction of sucrose. 4,426,232, Cl. 127-46.300.

Newlin, James L.; and Stadelman, William J., to Tip-E-Pak, Inc.; and Purdue Research Foundation. Deviled egg process. 4,426,400, Cl. 426-282.000.

Newman, Paul: *See*—
Sargent, Raymond F.; and Newman, Paul, 4,426,087, Cl. 277-3.000.

NGK Insulators, Ltd.: *See*—
Ogino, Toyohisa, 4,426,547, Cl. 174-31.00R.

Niehaus, William C.: *See*—
DiLorenzo, James V.; Hwang, James C.; Niehaus, William C.; Schlosser, Wolfgang O. W.; and Wemple, Stuart H., 4,426,656, Cl. 357-22.000.

Nielsen, Arnold T.: *See*—
Atkins, Ronald L.; Norris, William P.; Nielsen, Arnold T.; Hollins, Richard A.; and Wilson, William S., 4,426,539, Cl. 564-441.000.

Nieuwkamp, Wolfgang; Kroger, Dieter; and Raissle, Werner, to Lechler GmbH & Co. KG. Solid-cone jet nozzle for spraying liquids. 4,426,041, Cl. 239-468.000.

Nifco Inc.: *See*—
Omata, Nobuaki, 4,426,181, Cl. 411-33.000.

Nilsson, Clacs T.: *See*—
Jakobsen, Kjell M.; Nilsson, Clacs T.; and Larsson, Lars G., 4,426,416, Cl. 428-36.000.

Nilsson, John L. G.: *See*—
Arvidsson, Folke L.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Lindberg, Per. L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Nils U. E.; and Wikstrom, Hakan V., 4,426,386, Cl. 424-267.000.

Nippon Kogaku K.K.: *See*—
Hirose, Hideo, 4,426,136, Cl. 350-463.000.
Mori, Ikuo, 4,426,137, Cl. 350-471.000.

Nippon Shinyaku Co., Ltd.: *See*—
Matsumura, Shingo, deceased; Kise, Masahiro; Ozaki, Masakuni; Tada, Shinichi; Kazuno, Kenji; Watanabe, Hisao; Kunimoto, Katsutoshi; and Tsuda, Masami, 4,426,381, Cl. 424-250.000.

Nippon Soken, Inc.: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,425,792, Cl. 73-204.000.

Nippon Steel Corporation: *See*—
Sugino, Kazuo; Kageyama, Hideaki; and Masumoto, Hiroki, 4,426,236, Cl. 148-36.000.

Nippon Telegraph & Telephone Public Corp.: *See*—
Arishima, Koichi; Okada, Takeshi; Tate, Akiyuki; and Hiratsuka, Hiroaki, 4,426,434, Cl. 430-128.000.
Nagai, Haruo; Noguchi, Yoshio; and Takahei, Kenichiro, 4,426,704, Cl. 372-50.000.
Tamamura, Toshiaki; Imamura, Saburo; Morita, Masao; and Kogure, Osamu, 4,426,247, Cl. 156-643.000.

Nippon Thompson Co., Ltd.: *See*—
Mottate, Tatsuo, 4,426,119, Cl. 308-6.00C.

Nippondenso Co., Ltd.: *See*—
Hachitani, Shuji; Tanaka, Yasushi; Ogiso, Haruhiko; and Nakamura, Tetsuya, 4,425,889, Cl. 123-357.000.
Kato, Masaaki; and Akashi, Tetsuji, 4,425,894, Cl. 123-446.000.
Kato, Yoji; Yamaguchi, Shunzo; Fukazawa, Takeshi; and Saigo, Shinichi, 4,426,568, Cl. 219-270.000.
Murayama, Fumiaki, 4,425,896, Cl. 123-501.000.
Yoshida, Shuzo; Ono, Hironobu; Matsuo, Masashi; Hoshi, Kouich; Sueishi, Motoharu; and Ueda, Kazuo, 4,425,895, Cl. 123-489.000.

Nishikawa, Mineki: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; and Nishikawa, Mineki, 4,426,699, Cl. 371-68.000.

Nishikawa, Mitsuyo: *See*—
Kurihara, Nobuo; Morooka, Yasuo; Nishikawa, Mitsuyo; Miura, Kiyoshi; and Nagahashi, Yoshitoshi, 4,426,641, Cl. 340-683.000.

Nishino, Hiroshi: *See*—
Sato, Yasunobu; Fukumi, Hiroshi; Koike, Hiroyuki; and Nishino, Hiroshi, 4,426,382, Cl. 424-251.000.

Nissan Motor Company, Limited: *See*—
Kawasaki, Teruo, 4,426,691, Cl. 369-21.000.
Senoo, Tetsuo, 4,426,553, Cl. 179-117.000.
Tanaka, Toshiaki; and Ushimura, Shoji, 4,425,885, Cl. 123-299.000.
Yamabe, Masao; and Uchiyama, Masaaki, 4,426,100, Cl. 280-770.000.
Yamaguchi, Hiroshi, 4,425,890, Cl. 123-418.000.

Nissen Corporation: *See*—
Otte, Gary, 4,426,075, Cl. 272-69.000.

Nisshin Oil Mills, Ltd., The: *See*—
Sakai, Muneo; Taguchi, Gyota; Tsuji, Kiwako; and Sakita, Takashi, 4,426,395, Cl. 426-46.000.

NL Industries, Inc.: *See*—
Hazelrigg, Keith R., 4,426,104, Cl. 285-26.000.

Noguchi, Yoshio: *See*—
Nagai, Haruo; Noguchi, Yoshio; and Takahei, Kenichiro, 4,426,704, Cl. 372-50.000.

Nohara, Norimasa: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; and Nishikawa, Mineki, 4,426,699, Cl. 371-68.000.

Nola, Frank J., to United States of America, National Aeronautics and Space Administration. Pulsed thyristor trigger control circuit. 4,426,614, Cl. 323-243.000.

Nolte, Guther: *See*—
Blattermann, Karl-Gunther; Neuhaus, Gunter; and Nolte, Guther, 4,425,995, Cl. 198-605.000.

Nomura, Takeshi: *See*—
Miyazaki, Makoto; Nomura, Takeshi; Imai, Chihiro; and Yoda, Makoto, 4,426,314, Cl. 502-169.000.

Nordin, Dag E. V., to ITT Industries, Inc. Method of connecting two ringformed elements. 4,425,699, Cl. 29-505.000.

Nordstjernan AB: *See*—
Samuel, Olof, 4,425,878, Cl. 123-41.080.

Norris, William P.: *See*—
Atkins, Ronald L.; Norris, William P.; Nielsen, Arnold T.; Hollins, Richard A.; and Wilson, William S., 4,426,539, Cl. 564-441.000.

North, William E.: *See*—
Gabriel, Frank K.; and North, William E., 4,426,161, Cl. 374-144.000.

Northern Petrochemical Company: *See*—
Abel, Michael L.; and Yates, Thomas P., 4,426,309, Cl. 252-75.000.
Fries, Richard W.; and Buehler, Charles K., 4,426,318, Cl. 502-154.000.

Northern Telecom Limited: *See*—
Robinson, Anthony H. J.; and Peter, Erno, 4,426,675, Cl. 361-415.000.

Norton, Colin F.; and Harvey, Raymond G., to Mastergear Company Limited. Wormwheels. 4,425,815, Cl. 74-425.000.

Nouet, Christian, to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel. Power supply distribution system. 4,426,587, Cl. 307-66.000.

Nowotnik, David P.: *See*—
Cree, Gavin M.; Wilkins, Terence A.; Monks, Reginald; and Nowotnik, David P., 4,426,453, Cl. 436-500.000.

Noxso Corporation: *See*—
Magder, Jules, 4,426,365, Cl. 423-239.000.

Noyes, Paul R.; and Sommerfeld, Eugene G., to Du Pont de Nemours, E. I., and Company. Branched polyester coating compositions. 4,426,478, Cl. 524-361.000.

Nuckels, Nancy J.; and Thompson, James L., to Dow Chemical Company, The. Surfactant compositions useful in enhanced oil recovery processes. 4,426,303, Cl. 252-8.55D.

Nudo, Alexander S. Combined shelf-supporting bracket and clothes-rod support. 4,426,057, Cl. 248-235.000.

Nukem GmbH: *See*—
Hackstein, Karl-Gerhard; Hrovat, Milan; Huschka, Hans; and Koch, Karl-Heinz, 4,426,338, Cl. 264-0.500.

Nusslein, Ludwig: *See*—
Boroschewski, Gerhard; Nusslein, Ludwig; and Arndt, Friedrich, 4,426,222, Cl. 71-111.000.

O.P.E. Co. Ltd.: *See*—
Manabe, Nobuyuki; and Goto, Takahiro, 4,426,233, Cl. 134-21.000.

Obayashi, Hideki: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,425,792, Cl. 73-204.000.

Occidental Petroleum Corporation: *See*—
Chen, Paul Y.; and Madgavkar, Ajay M., 4,426,280, Cl. 208-254.00R.

Ochsner, Paul A., to Givaudan Corporation. Odorant alkadienyl ketones, alcohols and oximes. 4,426,321, Cl. 252-522.00R.

Odawara, Kozo: *See*—
Oritsuki, Ryoji; Watanabe, Tohru; Shirahashi, Kazuo; Kanai, Hiromi; and Odawara, Kozo, 4,426,548, Cl. 174-72.00R.

Oetiker, Hans. Method for manufacturing hose clamps. 4,425,781, Cl. 72-379.000.

Ogawa, Syuu: *See*—
Fujisaki, Iwao; Kosuge, Shuichi; Ogawa, Syuu; Sato, Kimihiko; and Soeda, Toshimi, 4,425,921, Cl. 128-690.000.

Ogawa, Tadashi: *See*—
Minamizono, Junji; Hirano, Mitunori; Kawashima, Yoshiro; and Ogawa, Tadashi, 4,426,445, Cl. 430-599.000.

Ogden, Marion E.: *See*—
Chambers, Robert O.; and Ogden, Marion E., 4,425,825, Cl. 74-804.000.

Ogihara, Toru, to Yoshida Kogyo K. K. Separable slide fastener. 4,425,685, Cl. 24-434.000.

Ogino, Toyohisa, to NGK Insulators, Ltd. Gas-filled insulating bushing having chambers separated by an insulating partition. 4,426,547, Cl. 174-31.00R.

Ogiso, Haruhiko: *See*—
Hachitani, Shuji; Tanaka, Yasushi; Ogiso, Haruhiko; and Nakamura, Tetsuya, 4,425,889, Cl. 123-357.000.

Ogren, Robert S., to Motor Wheel Corporation. Method and apparatus for mounting tires on rims. 4,425,954, Cl. 157-1.220.

Ogura, Ichiro; and Itoh, Ayao, to Tokyo Shibaura Denki Kabushiki Kaisha. Respiration flowmeter. 4,425,805, Cl. 73-861.290.

Ogura, Tomoki: *See*—
Matsumoto, Hiroshi; and Ogura, Tomoki, 4,426,150, Cl. 355-14.0SH.

Ogushi-Perez, Jose J.: *See*—
Cabrera-Montante, Armando; and Ogushi-Perez, Jose J., 4,426,218, Cl. 65-241.000.

Ohmura, Kazuhiro: *See*—
Jozuka, Masao; and Ohmura, Kazuhiro, 4,426,168, Cl. 400-224.000.

Ohnsmann, Klaus: *See*—
Weber, Otto; Ohnsmann, Klaus; and Christ, Ferdinand, 4,426,189, Cl. 414-786.000.

Ohshima, Jiro; Koshino, Yutaka; Ajima, Takashi; and Yonezawa, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of forming reproducible impurity zone of gallium or aluminum in a wafer by implanting through composite layers and diffusion annealing. 4,426,234, Cl. 148-1.500.

Ohta, Kazuho, to Victor Company of Japan, Limited. Method for preventing waveform distortion of a signal passing through an insulated conductor and circuit element embodying the method. 4,426,636, Cl. 338-314.000.

Ohta, Tokuya; and Eida, Tsuyoshi, to Canon Kabushiki Kaisha. Recording liquid. 4,426,226, Cl. 106-22.000.

Oka, Kozo, to Rank Xerox Limited. Process for forming an electrophotographic member having a protective layer. 4,426,435, Cl. 430-132.000.

Okabe, Mitsuyasu; Yoshioka, Takeo; Fukagawa, Yasuo; Okamoto, Rokuro; Kouno, Kageaki; and Ishikura, Tomoyuki, to Sanraku-Ocean Co., Ltd. Novel β-lactam compounds, process for producing thereof, and use thereof as medicines. 4,426,390, Cl. 424-274.000.

Okada, Takashi; and Tanaka, Yutaka, to Sony Corporation. Television receiver including a circuit for doubling line scanning frequency. 4,426,661, Cl. 358-140.000.

Okada, Takeshi: *See*—
Arishima, Koichi; Okada, Takeshi; Tate, Akiyuki; and Hiratsuka, Hiroaki, 4,426,434, Cl. 430-128.000.

Okami, Yoshiro; Yamada, Kazuhiko; and Takashio, Masachika, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Homocitric acid oligoriboside derivative for prevention of dental caries. 4,426,447, Cl. 435-74.000.

Okamoto, Rokuro: *See*—
Okabe, Mitsuyasu; Yoshioka, Takeo; Fukagawa, Yasuo; Okamoto, Rokuro; Kouno, Kageaki; and Ishikura, Tomoyuki, 4,426,390, Cl. 424-274.000.

Okamura, Shigemichi; and Watanabe, Masazumi, to Kikkoman Corporation. Novel hydroxy-cinnamic acid ester hydrolase and process for producing same. 4,426,448, Cl. 435-146.000.

Okuya, Tsutae; and Ito, Yoshiyuki, to Alps Electric Co., Ltd. Variable resistance device. 4,426,634, Cl. 338-161.000.

Olejkowski, Edwin: *See*—
Moustakas, Matthew A.; and Olejkowski, Edwin, 4,425,725, Cl. 40-152.000.

Olson, George E., to A. O. Smith Harvestore Products, Inc. Drive mechanism for a bottom silo unloader. 4,426,187, Cl. 414-310.000.

Olson, Ralph B.; and Musick, Stuart I., to Amco Corporation. Storage system for canned goods. 4,426,008, Cl. 211-49.00D.

Olympus Optical Company, Ltd.: *See*—
Hashimoto, Akihiko, 4,426,145, Cl. 354-195.100.
Kawazoe, Mitsuo, 4,426,144, Cl. 354-145.100.
Kimura, Kenji, 4,426,694, Cl. 369-46.000.
Kimura, Kenji, 4,426,694, Cl. 369-46.000.
Mizokami, Kazunori, 4,426,143, Cl. 354-416.000.
Sato, Masanobu, 4,426,738, Cl. 455-603.000.

Omata, Nobuaki, to Nifco Inc. Binder for panels. 4,426,181, Cl. 411-33.000.

Omiya, Takeo, to Daicel Chemical Industries, Ltd. Process for producing an alkali salt of a carboxymethylcellulose ether. 4,426,518, Cl. 536-98.000.

Omni Spectra, Inc.: *See*—
Kubota, James, 4,426,127, Cl. 339-177.00R.

Ong, S. Christine; and Bright, Margaret N., to Mobil Oil Corporation. Oriented p-methyl styrene polymer. 4,426,346, Cl. 264-290.200.

Ono, Hironobu: *See*—
Yoshida, Shuzo; Ono, Hironobu; Matsuo, Masashi; Hoshi, Kouich; Sueishi, Motoharu; and Ueda, Kazuo, 4,425,895, Cl. 123-489.000.

Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, to Sumitomo Chemical Company Limited. Diphenylalkanoether and diphenylalkanone oximeether derivatives. 4,426,394, Cl. 424-330.000.

Ono, Masaaki: *See*—
Kawaura, Kuninori; Yamada, Sumio; Wakatsuki, Noboru; Ono, Masaaki; Tanji, Shigeo; Fujiwara, Yoshiro; and Yanagisawa, Masanobu, 4,426,595, Cl. 310-313.00D.

Oregon Graduate Center: *See*—
Orloff, Jonathan H.; and Swanson, Lynwood W., 4,426,582, Cl. 250-396.0ML.

Oritsuki, Ryoji; Watanabe, Tohru; Shirahashi, Kazuo; Kanai, Hiromi; and Odawara, Kozo, to Hitachi, Ltd. Multilayer wiring structure. 4,426,548, Cl. 174-72.00R.

Orlando, Joseph, to Farnam Companies, Inc. Disposable rodent trap. 4,425,731, Cl. 43-58.000.

Orloff, Jonathan H.; and Swanson, Lynwood W., to Oregon Graduate Center. Charged particle beam apparatus and method utilizing liquid metal field ionization source and asymmetric three element lens system. 4,426,582, Cl. 250-396.0ML.

Ornum, Joel V.; and Chiu, Jessie T., to Rockcor, Inc. Sealant composition. 4,426,468, Cl. 523-166.000.

Ortho Diagnostic Systems Inc.: *See*—
Buffington, Sherry; and Wilson, Leonard T., 4,426,357, Cl. 422-61.000.

Oshio, Shuzo: *See*—
Kobayashi, Koichi; Kawashima, Kenichi; and Oshio, Shuzo, 4,426,439, Cl. 430-269.000.

Oswald, Donald R.: *See*—
Basseches, Harold; and Oswald, Donald R., 4,425,680, Cl. 24-7.000.

Otis Engineering Corporation: *See—*
Bayh, Russell L, III; and Boyle, William G., 4,425,965, Cl. 166-106.000.
Ott, Karl-Heinz: *See—*
Korte, Siegfried; Lindner, Christian; Suling, Carlhans; and Ott, Karl-Heinz, 4,426,499, Cl. 525-316.000.
Otte, Gary, to Nissen Corporation. Emergency shut-off switch for exercise apparatus. 4,426,075, Cl. 272-69.000.
Otto Brand GmbH: *See—*
Zimmermann, Hubert; and Kempf, Thomas, 4,426,241, Cl. 156-217.000.
Ottow, Alexander B.; Stiegeler, Arthur; and Tjaden, Jan, to Internationale Octrooi Maatschappij "Octropa" B.V. Food process. 4,426,401, Cl. 426-394.000.
Ovchinnikov, Lev N.: *See—*
Kiselnikov, Valentin N.; Shubin, Arkady A.; Vyalkov, Vladislav V.; Kruglov, Vitaly A.; Loginova, Tamara F.; Romanov, Viktor S.; Ovchinnikov, Lev N.; Varlamov, Valentin I.; Makarov, Jury A.; Penkov, Evgeny I.; Shvareva, Galina N.; and Shtefan, Vladimir N., 4,426,507, Cl. 526-303.100.
Owens-Corning Fiberglas Corporation: *See—*
Farrar, Gordon A.; and Friemoth, Melvin R., deceased, 4,426,217, Cl. 65-135.000.
Uffner, William E.; and White, Robert N., 4,426,419, Cl. 428-290.000.
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Oyama, Yoshishige: *See—*
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Ozaki, Masakuni: *See—*
Matsumura, Shingo, deceased; Kise, Masahiro; Ozaki, Masakuni; Tada, Shinichi; Kazuno, Kenji; Watanabe, Hisao; Kunimoto, Katsutoshi; and Tsuda, Masami, 4,426,381, Cl. 424-250.000.
P. L. Porter Company: *See—*
Porter, Clyde R., 4,425,987, Cl. 188-67.000.
Palm, John W., to Standard Oil Company (Indiana). Low temperature Claus process with water removal. 4,426,369, Cl. 423-574.00R.
Palmer, Leonard. Tumbling board and spring assembly. 4,426,076, Cl. 272-109.000.
Papa, Donald M.; and Powell, Walter W. Low pressure safety relief valve. 4,425,938, Cl. 137-489.000.
Papantoniou, Christos: *See—*
Jacquet, Bernard; Papantoniou, Christos; and Mondet, Jean, 4,426,375, Cl. 424-70.000.
Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Diphenyl ethers, their preparation and their use as herbicides. 4,426,220, Cl. 71-98.000.
Pargee, Robert W., Jr., to Eeco Incorporated. Television digital data frame with error detection. 4,426,698, Cl. 371-37.000.
Park, Kyong M., to Kavlico Corporation. Liquid capacitance pressure transducer technique. 4,425,799, Cl. 73-718.000.
Parker, Alfred B.: *See—*
Scragg, Robert L.; and Parker, Alfred B., 4,426,354, Cl. 376-320.000.
Parker, William H., to Manville Service Corporation. Furnace lining module. 4,425,749, Cl. 52-509.000.
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Lane, John E., 4,425,754, Cl. 57-265.000.
Parks, James E.: *See—*
Hurst, G. Samuel; Payne, Marvin G.; Chen, Chung-Hsuan; and Parks, James E., 4,426,576, Cl. 250-283.000.
Patch, Arthur H.: *See—*
Adamo, Rosario; and Patch, Arthur H., 4,426,156, Cl. 366-156.000.
Patel, Naren I.: *See—*
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Paulson, Arnold E.: *See—*
Bybee, Richard T.; Paulson, Arnold E.; and Warren, Holland D., 4,426,352, Cl. 376-255.000.
Payer, Wolfgang: *See—*
Bahadir, Mufit; Payer, Wolfgang; Forster, Ingrid; and Lummen, Hans-Albert, 4,426,315, Cl. 502-113.000.
Payne, Marvin G.: *See—*
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Peavey Electronics Corp.: *See—*
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Peavey, Hartley D., to Peavey Electronics Corp. Adjustable bridge for musical instrument. 4,425,832, Cl. 84-298.000.
Pedain, Josef: *See—*
Konig, Eberhard; Hombach, Rudolf; Dollhausen, Manfred; and Pedain, Josef, 4,426,487, Cl. 524-710.000.
Peiffer, Dennis G.; Lundberg, Robert D.; and Walker, Thad O., to Exxon Research and Engineering Co. Interfacial viscosification of aqueous acid systems utilizing sulfonated ionomers. 4,426,473, Cl. 524-111.000.
Pelham, Joseph E.: *See—*
Inman, Frank S.; and Pelham, Joseph E., 4,426,038, Cl. 239-265.150.
Penkov, Evgeny I.: *See—*
Kiselnikov, Valentin N.; Shubin, Arkady A.; Vyalkov, Vladislav V.; Kruglov, Vitaly A.; Loginova, Tamara F.; Romanov, Viktor S.; Ovchinnikov, Lev N.; Varlamov, Valentin I.; Makarov, Jury A.; Penkov, Evgeny I.; Shvareva, Galina N.; and Shtefan, Vladimir N., 4,426,507, Cl. 526-303.100.
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Pennwalt Corporation: *See—*
Adamo, Rosario; and Patch, Arthur H., 4,426,156, Cl. 366-156.000.
Kape, James M., 4,426,252, Cl. 156-665.000.
Pentz, William J., to Quaker Oats Company. Polyurethanes or isocyanurates from alkoxylated hydroxymethylfuran. 4,426,460, Cl. 521-115.000.
Penwalt Corporation: *See—*
Kulischenko, Walter; and Capdevielle, Martin J., 4,425,823, Cl. 74-665.0GE.
Pepper, Tony P. Game skinning aid. 4,425,678, Cl. 17-44.200.
Perilstein, Warren L., to Ethyl Corporation. Corrosion inhibitors for alcohol-based fuels. 4,426,208, Cl. 44-56.000.
Perkin-Elmer Corporation, The: *See—*
Miller, Mark C.; and Arthur, John R., 4,426,569, Cl. 219-272.000.
Mount, Bruce E.; and Rader, Con D., 4,425,804, Cl. 73-861.280.
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Robinson, Anthony H. J.; and Peter, Erno, 4,426,675, Cl. 361-415.000.
Petersen, Hans; and Stegmann, Kurt, to Diehl GmbH & Co.; and Diehl GmbH & Co. Bus system with address and status conductors. 4,426,697, Cl. 370-85.000.
Petrie, Ivan L., to Deere & Company. Method of assembling a pressure vessel. 4,425,698, Cl. 29-451.000.
Petrig, L. Benno: *See—*
Riva, Charles E.; and Petrig, L. Benno, 4,425,924, Cl. 128-745.000.
Petrolite Corporation: *See—*
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Woods, John H.; Laughlin, Charles E.; and Graves, Toby R., 4,426,329, Cl. 260-398.600.
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Petty, Herbert E., to Union Carbide Corporation. Organo siloxanes, method for the preparation thereof and polymeric compositions containing same. 4,426,480, Cl. 524-445.000.
Pfeifer, Thomas E. System for positioning containerized merchandise on a shelf. 4,426,009, Cl. 211-86.000.
Pfeiffer, Heinrich; and Speck, Ulrich, to Schering, Aktiengesellschaft. Novel N-hydroxyalkylated dicarboxylic acid bis(3,5-dicarbamoyl-2,4,6-triiodoanilides), as X-ray contrast media. 4,426,371, Cl. 424-5.000.
Phillips Petroleum Company: *See—*
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Pierre, Alexandre: *See—*
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Pinkstaff, Carlos D.: *See—*
Bradcovich, James M.; Wake, Robert H.; Kovacs, Richard M., Jr.; and Pinkstaff, Carlos D., 4,426,578, Cl. 250-363.00S.
Pioneer Electronic Corporation: *See—*
Kawanabe, Yoshihiro, 4,426,626, Cl. 330-267.000.
Pippert, Aaron J., to Utex Industries, Inc. Fluid control device. 4,425,838, Cl. 92-86.000.
Plaquin, Bernard; Bounie, Paul; and Mantelle, Jean, to Vallourec. Joints for pipes, particularly intended for the oil industry. 4,426,105, Cl. 285-92.000.
Plastomedical Sciences, Inc.: *See—*
Steckler, Robert, 4,426,492, Cl. 525-61.000.
Player, Wayne H., to Howmet Aluminum Corp. Twin-vee ceiling hanger clip. 4,425,747, Cl. 52-404.000.
PLM Aktiebolag: *See—*
Jakobsen, Kjell M.; Nilsson, Claes T.; and Larsson, Lars G., 4,426,416, Cl. 428-36.000.
Plummer, Ernest L., to FMC Corporation. Heterocyclic substituted benzyl alcohol, insecticidal ester derivatives, and intermediates. 4,426,524, Cl. 544-336.000.
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Krishnakumar, Suppayan M.; Pocock, John F. E.; and Harry, Ieuan L., 4,426,202, Cl. 425-534.000.
Podgorny, Gerald J.: *See—*
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Pogrzeba, Hans J.: *See—*
Heyn, Klaus; and Pogrzeba, Hans J., 4,425,757, Cl. 60-39.182.
Polaroid Corporation: *See—*
Minns, Richard A., 4,426,505, Cl. 526-283.000.
Sullivan, Charles I., 4,426,481, Cl. 524-460.000.

Pollman, Frederic W., to Sundstrand Corporation. Viscosity compensating circuits. 4,426,194, Cl. 417-218.000.
Polsfuss, Marvin F. Compression tool, useable as nutshell remover. 4,425,707, Cl. 30-120.300.
Polyakov, Vladimir I.: *See*—
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Polycore Optical Pte. Ltd.: *See*—
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Kent, Eric G., 4,426,497, Cl. 525-194.000.
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Pomorin, Karl-Heinz: *See*—
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Porta, Livio D.; Berkowitz, David A.; Withuhn, William L.; and Hamilton, Carl C., to American Coal Enterprises, Inc. Coal-fired steam locomotive. 4,425,763, Cl. 60-693.000.
Porter, Clyde R., to P. L. Porter Company. Dual rotating mechanical lock. 4,425,987, Cl. 188-67.000.
Porucznik, Paul: *See*—
Franek, Josef T.; and Porucznik, Paul, 4,425,778, Cl. 72-347.000.
Postle, Stephen R.; and Thomas, Patrick D. P., to Ciba Geigy AG. Hydroquinone derivatives and their use in photographic materials. 4,426,444, Cl. 430-566.000.
Pousette, Ronald D.; and Sanders, John L., to Brunette Machine Works, Ltd. Hollow debarking arm. 4,425,951, Cl. 144-208.00E.
Pousette, Ronald D.; and Sanders, John L., to Brunette Machine Works Ltd. Log-feed apparatus. 4,425,952, Cl. 144-246.00F.
Powell, Walter W.: *See*—
Papa, Donald M.; and Powell, Walter W., 4,425,938, Cl. 137-489.000.
PPG Industries, Inc.: *See*—
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Price Pfister, Inc.: *See*—
Gonzalez, Teodoro J., 4,425,935, Cl. 137-315.000.
Prigent, Michel: *See*—
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Marcus, Konrad H., 4,425,717, Cl. 33-361.000.
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Products Research & Chemical Corp.: *See*—
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Produits Chimiques Ugine Kuhlmann: *See*—
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Protein Foods (U.K.) Limited: *See*—
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Puckett, Joe D.; and Bryant, Donald L., to Jacuzzi Inc. Skimmer. 4,426,286, Cl. 210-121.000.
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Purdie, Clarence E., deceased (by Purdie, Irene D., executor), to Gopher Shooter's Supply Company, Incorporated. Cartridge case holder apparatus. 4,425,833, Cl. 86-44.000.
Purdie, Irene D., executor: *See*—
Purdie, Clarence E., deceased, 4,425,833, Cl. 86-44.000.
Purdue Research Foundation: *See*—
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Pyle, Charles B.: *See*—
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Pylon Electronic Development Company Ltd.: *See*—
Vandrish, George, 4,426,214, Cl. 55-511.000.
PyMaH Corporation: *See*—
Hof, Craig R.; and Shah, Hasmukh, 4,425,998, Cl. 206-306.000.
Quaker Oats Company: *See*—
Pentz, William J., 4,426,460, Cl. 521-115.000.
Quella, Ferdinand; and Schmidt, Hans-Friedrich, to Siemens Aktiengesellschaft. Method of producing glass carbon. 4,426,368, Cl. 423-445.000.
Quenzi, Phil. Pocket tool. 4,425,709, Cl. 30-151.000.
Quigley, Thomas J., to Continental-Wirt Electronics Corp. Switch housing structure for connection to switch terminal board. 4,426,557, Cl. 200-16.00D.
Quikstak, Inc.: *See*—
Boyland, Ernest E., 4,426,184, Cl. 414-82.000.
Quinn, Russell C.: *See*—
Wolf, Theodore L.; Rossman, John A.; Quinn, Russell C.; and Kish, Thomas J., 4,426,188, Cl. 414-667.000.
Quist, Ingmar P.; Railton, Jeffrey D.; and Lemon, Peter H. R. B., to Borden (UK) Limited. Foundry molding compositions and process. 4,426,467, Cl. 523-145.000.
Qume Corporation: *See*—
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Racemark International, Inc.: *See*—
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Raikamo, Seppo. Boat with interior accommodation space, and structural part thereof. 4,425,861, Cl. 114-71.000.
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Quist, Ingmar P.; Railton, Jeffrey D.; and Lemon, Peter H. R. B., 4,426,467, Cl. 523-145.000.
Raissle, Werner: *See*—
Nieuwkamp, Wolfgang; Kroger, Dieter; and Raissle, Werner, 4,426,041, Cl. 239-468.000.
Rajski, Pat A.: *See*—
Gebert, Kenneth W.; and Rajski, Pat A., 4,426,412, Cl. 427-356.000.
Rampon Products, Inc.: *See*—
Harper, Oris E., 4,425,912, Cl. 128-80.00C.
Ramsey, Henry R.: *See*—
Garceau, Ronald; and Ramsey, Henry R., 4,426,070, Cl. 267-91.000.
Rand, James L., to United States of America, National Aeronautics and Space Administration. Thin film strain transducer. 4,425,808, Cl. 73-862.650.
Rank Xerox Limited: *See*—
Oka, Kozo, 4,426,435, Cl. 430-132.000.
Rapp, Willard E., to Western Electric Company, Inc. Relay cutting tool. 4,425,708, Cl. 30-133.000.
Rast, Wlodzimierz, to Ridge Tool Company. Tube expanding tool. 4,425,783, Cl. 72-393.000.
Ratliff, Willa D. L. Woman's outer garment and pattern therefor. 4,425,712, Cl. 33-12.000.
Raue, Roderich: *See*—
Berneth, Horst; and Raue, Roderich, 4,426,530, Cl. 548-256.000.
Ray, Cole; Vincent, John; and Small, Clifford, to Memorial Hospital for Cancer and Allied Diseases. Humidifier-injector for jet ventilator. 4,425,914, Cl. 128-200.140.
Raychem Corporation: *See*—
Alston, William W., Jr.; Bloom, William G.; and Johnson, William C., 4,425,919, Cl. 128-658.000.
Fentress, Vernon A., 4,426,413, Cl. 428-36.000.
Kamath, Hundi P.; and Leder, Jeffrey C., 4,426,339, Cl. 264-22.000.
Taylor, James M., 4,426,633, Cl. 338-25.000.
Raymont, Michael E. D.: *See*—
Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; Shrive, Nigel G.; and Raymont, Michael E. D., 4,426,456, Cl. 501-84.000.
RCA Corporation: *See*—
Botez, Dan, 4,426,701, Cl. 372-45.000.
Brown, Richard; and Jozwiak, Phillip C., 4,426,249, Cl. 156-653.000.
Butterwick, Gilbert N., 4,426,596, Cl. 313-534.000.
Harwood, Leopold A.; and Shanley, Robert L., II, 4,426,625, Cl. 330-254.000.
Kirschner, Thomas F., 4,426,349, Cl. 264-346.000.
Knop, Karl H., 4,426,130, Cl. 350-162.200.
Tults, Juri; and Wine, Charles M., 4,426,734, Cl. 455-180.000.
Rearick, William A.: *See*—
Winch, Allen R.; and Rearick, William A., 4,425,842, Cl. 100-37.000.
Redler Conveyors Limited: *See*—
Wheeler, Eric; and Arthur, Gerald F., 4,426,185, Cl. 414-196.000.
Reedy, Robert P.; and Crawford, Daniel W., to United States of America, Energy. Precision translator. 4,426,055, Cl. 248-184.000.
Regenerative Environmental Equipment Co., Inc.: *See*—
Benedick, Edward H., 4,426,360, Cl. 422-173.000.
Reid, Robert F.: *See*—
Becconsall, Jack K.; Cramp, John H. W.; Reid, Robert F.; Moore, Reginald C.; Rye, Barry J.; and Thomas, Eric L., 4,426,640, Cl. 340-632.000.
Reinhard, Cheyenne A. Folding fire escape ladder. 4,425,983, Cl. 182-96.000.
Rengo Kabushiki Kaisha (Rengo Co., Ltd.): *See*—
Tokuno, Masateru, 4,425,695, Cl. 29-113.00R.
Rensselaer Polytechnic Institute: *See*—
Harteck, Paul, 4,426,367, Cl. 423-395.000.
Republic Molding Corporation: *See*—
Coltman, Bertram W., Jr., 4,426,014, Cl. 220-307.000.
Reschke, Lothar: *See*—
Seifert, Rolf; Zimmet, Hans; Welzel, Herbert; and Reschke, Lothar, 4,426,146, Cl. 354-246.000.
Resdev, Inc.: *See*—
Beasley, Marvin L.; and Brennan, J. B., 4,426,494, Cl. 525-86.000.

Rettkowski, Gale F.: *See*—
Rodrigues, John G., Jr.; Rettkowski, Gale F.; and Jessup, William H., 4,426,096, Cl. 280-411.00C.

Reuter, Hans J.; Take, Hermann; and Werner, Charles, to Mecan ARBED s.a r.l. Method of and an apparatus for the manipulation of a starting chain for format changes in a continuous casting installation. 4,425,960, Cl. 164-426.000.

Rez, Donald H. Handled mold package. 4,426,002, Cl. 206-523.000.

Rhone-Poulenc Industries: *See*—
Gauthier-Lafaye, Jean; and Perron, Robert, 4,426,537, Cl. 562-519.000.
Szilagyi, Ferenc, 4,425,856, Cl. 110-346.000.

Rhone-Poulenc Specialites Chimiques: *See*—
Dromard, Adrien; and Millet, Claude, 4,426,508, Cl. 528-23.000.

Ricardo Consulting Engineers plc: *See*—
Thring, Robert H.; and Hollis, Terence, 4,425,884, Cl. 123-272.000.

Richard, Maurice E.; and Winarski, Daniel J., to International Business Machines Corp. Single reel tape cartridge. 4,426,047, Cl. 242-197.000.

Richards, Deanna E.: *See*—
McGregor, Jon D. C.; and Richards, Deanna E., 4,425,853, Cl. 109-25.000.

Richart, Jene A.; Beitler, Bradley D.; and Deeken, David G., to Exxon Production Research Co. Remote alignment method and apparatus. 4,426,173, Cl. 405-195.000.

Ricoh Co., Ltd.: *See*—
Hashimoto, Mitsuru; Masafumi, Ohta; Kozima, Akio; Sakai, Kiyoshi; and Sasaki, Masaomi, 4,426,327, Cl. 260-160.000.
Horike, Masanori; and Ebi, Yutaka, 4,426,652, Cl. 346-75.000.
Komada, Kenya, 4,426,653, Cl. 346-153.100.
Mizuma, Kenichi, 4,426,073, Cl. 271-251.000.

Ridge Tool Company: *See*—
Rast, Wlodzimierz, 4,425,783, Cl. 72-393.000.

Rieger, Franz: *See*—
Franke, Horst; Linder, Ernst; Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,425,788, Cl. 73-35.000.

Rieppel, Perry J.: *See*—
Coughlin, William J.; Rieppel, Perry J.; and Hoffman, Stephen A., 4,426,566, Cl. 219-137.410.

Rieser, Michael J. Laryngoscope. 4,425,909, Cl. 128-16.000.

Riffe, Josephus; and Sinha, Rajiv, to Harris Corporation. Fast cache flush mechanism. 4,426,682, Cl. 364-200.000.

Riken Vitamin Co., Ltd.: *See*—
Yasumatsu, Toshihito; Nakase, Toshiaki; Kubozuka, Toshinori; and Kawabata, Kaoru, 4,426,477, Cl. 524-306.000.

Riley, Harry F.: *See*—
Sperry, Charles R.; and Riley, Harry F., 4,426,023, Cl. 222-132.000.

Rinne, Risto A., Jr. Bird feeder. 4,425,873, Cl. 119-51.00R.

Rinchmuller, Klaus, to Thomson-CSF. Switch controllable off and on by pulses. 4,426,590, Cl. 307-255.000.

Rise, William E., to Android Corporation. Bearing assembly machine. 4,425,703, Cl. 29-724.000.

Rishton, John E. Integral hair clip and method of manufacture. 4,425,926, Cl. 132-46.00R.

Ritchie, Leon T.; Snyder, Clair W., Jr.; and Woratyla, John A., to AMP Incorporated. Cam actuated zero insertion connector assembly. 4,426,123, Cl. 339-75.0MP.

Rittenbach, Otto E., to United States of America, Army. Frequency discriminator. 4,426,622, Cl. 329-143.000.

Riva, Charles E.; and Petrig, L. Benno. Blood velocity measurement in retinal capillaries utilizing the blue field entoptic phenomenon. 4,425,924, Cl. 128-745.000.

Riviere, Donald L., to Menasha Corporation. Pallet construction. 4,425,852, Cl. 108-56.300.

Rizzutto, Junko; and McGlew, Timothy E. Boutonniere attaching pin. 4,425,679, Cl. 24-6.000.

Robert Bosch GmbH: *See*—
Engel, Gerhard; and Wessel, Wolf, 4,425,888, Cl. 123-339.000.
Franke, Horst; Linder, Ernst; Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,425,788, Cl. 73-35.000.
Knapp, Heinrich; and Schillinger, Rainer, 4,425,887, Cl. 123-339.000.
Moder, Helmut, 4,426,589, Cl. 307-254.000.

Roberts, Douglas J.: *See*—
Libby, Edwin L.; Maddox, Randall A.; and Roberts, Douglas J., 4,426,153, Cl. 355-3.00R.

Roberts, Roger F.: *See*—
Banks, Eddie D.; Simmons, Gerald C.; and Roberts, Roger F., 4,426,051, Cl. 244-137.00R.

Robertshaw Controls Company: *See*—
Sliger, Boyd P., 4,426,036, Cl. 236-34.500.
Weaver, Marvin P., 4,425,941, Cl. 137-871.000.

Robertson, Forrest E.: *See*—
Williams, Donald E.; and Robertson, Forrest E., 4,425,973, Cl. 172-574.000.

Robey, Roger L., to Eli Lilly and Company. Synthesis of phenylacetic acid esters. 4,426,536, Cl. 560-105.000.

Robinson, Anthony H. J.; and Peter, Erno, to Northern Telecom Limited. Carrier for circuit boards. 4,426,675, Cl. 361-415.000.

Rochat, Alain C.; and Cassar, Luigi, to Ciba-Geigy Corporation. Process for producing bismethine isoindolines. 4,426,533, Cl. 548-471.000.

Rocheleau, Michael O.: *See*—
Klein, David M.; Wimberger, Richard J.; Rocheleau, Michael O.; and Helms, Randall D., 4,425,719, Cl. 34-156.000.

Rochlus, Bertram J. Rotating cylinder internal combustion engine. 4,425,880, Cl. 123-44.00C.

Rockcor, Inc.: *See*—
Ornum, Joel V.; and Chiu, Jessie T., 4,426,468, Cl. 523-166.000.

Rockwell International Corporation: *See*—
Cline, Charles D., 4,425,704, Cl. 29-764.000.
Folkmann, Andrew F., 4,426,630, Cl. 333-174.000.
Wells, Calvin G.; and Malkowski, Joseph L., 4,425,817, Cl. 74-467.000.

Roderfeld, Heinrich: *See*—
Kersting, Hermann; and Roderfeld, Heinrich, 4,425,925, Cl. 130-22.00A.

Rodrigues, John G., Jr.; Rettkowski, Gale F.; and Jessup, William H. Bridge cart. 4,426,096, Cl. 280-411.00C.

Roe, William J., to Nalco Chemical Company. Cationic polymers for use in freeze protection of coals and minerals. 4,426,409, Cl. 427-221.000.

Rogers, Thomas K., to Cities Service Company. Process for making olefin polymerization catalyst. 4,426,317, Cl. 502-120.000.

Rohde, Dieter; and Preatorius, Siegfried, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic vehicle tire having a rubber layer between belt plies. 4,425,953, Cl. 152-360.000.

Rohm and Haas Company: *See*—
DelDonno, Theodore A., 4,426,510, Cl. 528-49.000.

Rohowsky, Bohdan: *See*—
Geisel, Anthony; and Rohowsky, Bohdan, 4,425,985, Cl. 182-121.000.

Rolinski, Edmund J.: *See*—
Stevison, Donald F.; and Rolinski, Edmund J., 4,426,705, Cl. 372-58.000.

Rolls-Royce Limited: *See*—
Ballard, John R.; Bennett, George H.; and Lee, Leslie A., 4,425,756, Cl. 60-39.092.
Hughes, Eric, 4,425,755, Cl. 60-39.550.
Sargent, Raymond F.; and Newman, Paul, 4,426,087, Cl. 277-3.000.

Romanov, Viktor S.: *See*—
Kiselnikov, Valentin N.; Shubin, Arkady A.; Vyalkov, Vladislav V.; Kruglov, Vitaly A.; Loginova, Tamara F.; Romanov, Viktor S.; Ovchinnikov, Lev N.; Varlamov, Valentin I.; Makarov, Jury A.; Penkov, Evgeny I.; Shvareva, Galina N.; and Shtefan, Vladimir N., 4,426,507, Cl. 526-303.100.

Ronai, Anne A. Collapsible structure. 4,425,741, Cl. 52-70.000.

Ronchetti, Camillo; Borroni, Pierantonio; and Buzzanca, Giovanni, to C.I.S.E. SpA. Probe for the continuous in-situ measurement of the corrosion rate of pipes at high temperature or having high-resistivity liquids flowing therethrough. 4,426,618, Cl. 324-65.0CR.

Rosen, George J.: *See*—
Markey, Dennis P.; and Rosen, George J., 4,425,742, Cl. 52-90.000.

Rosenthal, L. Kenneth. Optical illusion beverage dispensing device. 4,426,021, Cl. 222-129.100.

Rosomm, Herbert: *See*—
Schwenke, Joachim; Knoth, Joachim; Marten, Rainer; and Rosomm, Herbert, 4,426,717, Cl. 378-45.000.

Rossman, John A.: *See*—
Wolf, Theodore L.; Rossman, John A.; Quinn, Russell C.; and Kish, Thomas J., 4,426,188, Cl. 414-667.000.

Rotella, Sam S. Postureometer. 4,425,713, Cl. 33-174.00D.

Rouse, James S. X-Ray marker device. 4,426,723, Cl. 373-22.000.

Roush, Walter T. Stem packing with slitted flexible polymer sleeve. 4,426,093, Cl. 277-110.000.

Rousseau, Valerie M., to Wright Line Inc. Workholder and carrier for electrodeposition system. 4,426,273, Cl. 204-297.00W.

Roussel Uclaf: *See*—
Vignau, Michel; and Heymes, Rene, 4,426,519, Cl. 544-27.000.

Rowe, Edward A., Jr., to Diamond Shamrock Corporation. Process for removing undesirable substances from electrical devices. 4,425,949, Cl. 141-1.000.

Ruh, Wolf-Dieter: *See*—
Brunsch, Arwed; Ruh, Wolf-Dieter; and Trippel, Gerhard, 4,426,265, Cl. 204-192.00M.

Ruhrchemie Aktiengesellschaft: *See*—
Bahadir, Mufit; Payer, Wolfgang; Forster, Ingrid; and Lummen, Hans-Albert, 4,426,315, Cl. 502-113.000.

Rusnica, Edward J.: *See*—
Zegar, Martin J.; Kish, Nicholas W.; Rusnica, Edward J.; Jenkins, Howard S.; and Sarver, Stephen J., 4,426,350, Cl. 376-283.000.

Russell, James T.: *See*—
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Ruter, Franz, to M.A.N. Maschinenfabrik Augsburg-Nurnberg A.G. Apparatus for measuring the travel speed of automatic welding machines. 4,426,565, Cl. 219-130.010.

Rutledge, Gerald D.; and Yoon, Heeyoung, to Conoco Inc. Alcohol dissociation and waste heat recovery process for automobiles. 4,425,876, Cl. 123-3.000.

Ryder, Leonard B.: *See*—
Vieth, Wolf R.; and Ryder, Leonard B., 4,426,427, Cl. 428-542.800.

Rye, Barry J.: *See*—
Becconsall, Jack K.; Cramp, John H. W.; Reid, Robert F.; Moore, Reginald C.; Rye, Barry J.; and Thomas, Eric L., 4,426,640, Cl. 340-632.000.

Saab, Alfredo H.: *See*—
Nagy, Bela G.; and Saab, Alfredo H., 4,426,609, Cl. 318-729.000.

Saat- und Erntetechnik GmbH: *See*—
Horner, Ernst L.; Knolle, Jurgen C.; and Grimm, Hans, 4,425,865, Cl. 118-19.000.

Sach, George S.: *See—*
Durant, Graham J.; Ganellin, Charon R.; and Sach, George S., 4,426,526, Cl. 546-300.000.

Sacks, Clifford E., to Upjohn Company, The. Process for making phosphorus derivatives of aminothiomethylcarbamates. 4,426,335, Cl. 260-968.000.

Saeki, Junichi: *See—*
Tsuzuku, Susumu; Kaneda, Aizo; Saeki, Junichi; and Aoki, Masayoshi, 4,426,341, Cl. 264-40.100.

Saeki, Yukio; and Tanaka, Katsuyuki, to Sumitomo Durez Company, Ltd. Method for accelerating cure of resole type phenolic resins. 4,426,484, Cl. 524-541.000.

Saigo, Shinichi: *See—*
Kato, Yoji; Yamaguchi, Shunzo; Fukazawa, Takeshi; and Saigo, Shinichi, 4,426,568, Cl. 219-270.000.

Saiki, Shuji; Sato, Katuaki; Sato, Kazue; Ishikawa, Seiichi; Inoue, Hideaki; and Tanaka, Tsuneo, to Matsushita Electric Industrial Co., Ltd. Electrodynamic loudspeaker. 4,426,556, Cl. 179-115.5DV.

Saito, Katsutoshi: *See—*
Kuroda, Takao; Kajimura, Takashi; Umeda, Jun-ichi; and Saito, Katsutoshi, 4,426,703, Cl. 372-46.000.

Sakai, Kiyoshi: *See—*
Hashimoto, Mitsuru; Masafumi, Ohta; Kozima, Akio; Sakai, Kiyoshi; and Sasaki, Masaomi, 4,426,327, Cl. 260-160.000.

Sakai, Muneo; Taguchi, Gyota; Tsuji, Kiwako; and Sakita, Takashi, to Nisshin Oil Mills, Ltd., The. Retort salad and its production process. 4,426,395, Cl. 426-46.000.

Sakai, Yuki; and Nakamura, Hiroya, to Konishiroku Photo Industry Co., Ltd. Character generating system. 4,426,645, Cl. 340-724.000.

Sakamoto, Takashi; and Sano, Tetsuo, to Dainippon Screen Seizo Kabushiki Kaisha. Method and machine for positioning films on base sheets. 4,426,152, Cl. 355-75.000.

Sakata, Shinji: *See—*
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Sakita, Takashi: *See—*
Sakai, Muneo; Taguchi, Gyota; Tsuji, Kiwako; and Sakita, Takashi, 4,426,395, Cl. 426-46.000.

Sakmann, Walter H., to International Business Machines Corporation. Type band and band printer with automatic print band recognition. 4,425,846, Cl. 101-111.000.

Salisbury, Wayne C., to Ex-Cell-O Corporation. Polyurethane rim system. 4,426,348, Cl. 264-328.600.

Salmonson, Duane L.: *See—*
Copeland, James L.; Fernholz, Peter J.; Larson, Spencer B.; Salmonson, Duane L.; and Weick, Michael D., 4,426,362, Cl. 422-263.000.

Samuel, Olof, to Nordstjernan AB. Internal combustion engine cooling method and device. 4,425,878, Cl. 123-41.080.

Sanchez, Domingo: *See—*
Arvidsson, Folke L.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Lindberg, Per. L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Nils U. E.; and Wikstrom, Hakan V., 4,426,386, Cl. 424-267.000.

Sanders, John L.: *See—*
Pousette, Ronald D.; and Sanders, John L., 4,425,951, Cl. 144-208.00E.
Pousette, Ronald D.; and Sanders, John L., 4,425,952, Cl. 144-246.00F.

Sanders, Rudolf: *See—*
Mollet, Adrianus J. T.; and Sanders, Rudolf, 4,426,602, Cl. 315-58.000.

Sandri, Joseph M.; Calentine, John W.; Linder, Seymour M.; and Billoux, Yves J., to Alcolac Inc. Derivatives of aminoalkyl alkylene ureas and their use as wet adhesion promoters. 4,426,503, Cl. 526-263.000.

Sankyo Company Limited: *See—*
Sato, Yasunobu; Fukumi, Hiroshi; Koike, Hiroyuki; and Nishino, Hiroshi, 4,426,382, Cl. 424-251.000.

Sano, Seiichi: *See—*
Maki, Masao; Fukuda, Hiroshi; and Sano, Seiichi, 4,426,465, Cl. 523-135.000.

Sano, Tetsuo: *See—*
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Sanraku-Ocean Co., Ltd.: *See—*
Okabe, Mitsuyasu; Yoshioka, Takeo; Fukagawa, Yasuo; Okamoto, Rokuro; Kouno, Kageaki; and Ishikura, Tomoyuki, 4,426,390, Cl. 424-274.000.

Sanyo Denki Co., Ltd.: *See—*
Suita, Muneo; and Mogi, Kazuo, 4,426,606, Cl. 318-375.000.

Sanyo Electric Co., Ltd.: *See—*
Masao, Morimoto, 4,425,840, Cl. 98-40.00V.

Saraf, Israel E., to Solmat Systems Ltd. Method of and apparatus for measuring the density profile of a liquid layer. 4,425,787, Cl. 73-32.00R.

Sargent, Raymond F.; and Newman, Paul, to Rolls-Royce Limited. Non-contacting gas seal for relatively rotating parts. 4,426,087, Cl. 277-3.000.

Sarin, Vinod K.; and Buljan, Sergej-Tomislav, to GTE Laboratories. Carbide coated composite modified silicon aluminum oxynitride cutting tools. 4,426,209, Cl. 51-295.000.

Sarkans, Ivars; and Figgins, Charles A., to American Standard, Inc. Method for producing a manifold assembly. 4,426,242, Cl. 156-252.000.

Sarver, Stephen J.: *See—*
Zegar, Martin J.; Kish, Nicholas W.; Rusnica, Edward J.; Jenkins, Howard S.; and Sarver, Stephen J., 4,426,350, Cl. 376-283.000.

Sasaki, Masaomi: *See—*
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Sasaki, Nobuo; and Nakano, Motoo, to Fujitsu Limited. Semiconductor device and method for manufacturing the same. 4,425,700, Cl. 29-571.000.

Sasaki, Osamu: *See—*
Sawada, Kiyoshi; Goto, Satoshi; Sasaki, Osamu; Takahashi, Jiro; and Komamura, Tawara, 4,426,432, Cl. 430-58.000.

Sasaki, Yoshitaka; and Yamashita, Keitaro. Method of fabricating a steel pressure roll for use in a pressure-fixation apparatus. 4,426,411, Cl. 427-349.000.

Satake Engineering Co., Ltd.: *See—*
Satake, Toshihiko, 4,426,005, Cl. 209-581.000.

Satake, Toshihiko, to Satake Engineering Co., Ltd. Device for preventing scattering of particles for color sorting apparatus. 4,426,005, Cl. 209-581.000.

Sato, Katuaki: *See—*
Saiki, Shuji; Sato, Katuaki; Sato, Kazue; Ishikawa, Seiichi; Inoue, Hideaki; and Tanaka, Tsuneo, 4,426,556, Cl. 179-115.5DV.

Sato, Kazue: *See—*
Saiki, Shuji; Sato, Katuaki; Sato, Kazue; Ishikawa, Seiichi; Inoue, Hideaki; and Tanaka, Tsuneo, 4,426,556, Cl. 179-115.5DV.

Sato, Kimihiko: *See—*
Fujisaki, Iwao; Kosuge, Shuichi; Ogawa, Syuu; Sato, Kimihiko; and Soeda, Toshimi, 4,425,921, Cl. 128-690.000.

Sato, Kiyoshi: *See—*
Shinozaki, Kichitaro; Sato, Kiyoshi; and Shimizu, Toru, 4,425,774, Cl. 72-257.000.

Sato, Masanobu, to Olympus Optical Company Limited. Dictating machine. 4,426,738, Cl. 455-603.000.

Sato, Yasunobu; Fukumi, Hiroshi; Koike, Hiroyuki; and Nishino, Hiroshi, to Sankyo Company Limited. 4-Amino-6,7-dimethoxy-2-piperazinylquinazoline derivatives, their preparation and use. 4,426,382, Cl. 424-251.000.

Satoh, Isao; Yoshida, Tomio; Harigae, Shunji; and Koishi, Kenji, to Matsushita Electric Industrial Co., Ltd. Light source intensity control in an optical recording and reproducing apparatus. 4,426,693, Cl. 369-45.000.

Satoh, Shin; Susa, Kenzo; Matsuyama, Iwao; and Suganuma, Tsuneo, to Hitachi, Ltd. Process for producing optical glass. 4,426,216, Cl. 65-18.100.

Sattlegger, Hans: *See—*
Maass, Gunther; Sattlegger, Hans; and Lucking, Hans J., 4,426,509, Cl. 528-34.000.

Sauer, Alfred E., to B. A. Ballou & Co., Incorporated. Safety clasp for jewelry. 4,425,687, Cl. 24-664.000.

Savin Corporation: *See—*
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Sawada, Kiyoshi; Goto, Satoshi; Sasaki, Osamu; Takahashi, Jiro; and Komamura, Tawara, to Konishiroku Photo Industry Co., Ltd. Electrophotosensitive receptor with trisazo compound. 4,426,432, Cl. 430-58.000.

Sawano, Hiroshi: *See—*
Shiozawa, Kazuo; and Sawano, Hiroshi, 4,426,147, Cl. 354-286.000.

Scaran, Robert R.: *See—*
Mason, Michael P.; and Scaran, Robert R., 4,425,710, Cl. 30-229.000.

Schanze, Rudolf. Process for the production of a concentrate containing a bee product, a concentrate containing a bee product and its use. 4,426,397, Cl. 426-62.000.

Scheffer-Klute GmbH & Co.: *See—*
Scheffer, Walter, 4,425,934, Cl. 137-223.000.

Scheffer, Walter, to Scheffer-Klute GmbH & Co. Head of an air pump for inflating pneumatic tires having a motorcycle valve. 4,425,934, Cl. 137-223.000.

Scheffers, Cornelis J. W. M.: *See—*
Limper, Nicolaas H.; and Scheffers, Cornelis J. W. M., 4,426,599, Cl. 313-389.000.

Schele, Franz, to Zahnradfabrik Friedrichshafen AG. Multiple disc friction clutch. 4,425,994, Cl. 192-85.0AA.

Schenck, Alexander W. Telescoping fastener. 4,425,686, Cl. 24-604.000.

Schering Aktiengesellschaft: *See—*
Boroschewski, Gerhard; Nusslein, Ludwig; and Arndt, Friedrich, 4,426,222, Cl. 71-111.000.
Pfeiffer, Heinrich; and Speck, Ulrich, 4,426,371, Cl. 424-5.000.

Schexnayder, Lawrence F.; and Thies, Jerome A., to Caterpillar Tractor Co. Maintaining hydrostatic system control pressure. 4,425,758, Cl. 60-403.000.

Schiller, August: *See—*
Sommer, Oswin; Dorsch, Norman; Bosch, Erhard; Schiller, August; and Strasser, Alois, 4,426,474, Cl. 524-243.000.

Schilling, Hugh K., to Horton Industries, Inc. Fluid engaged spring released fan clutch having a modular mount for a spring engaged fluid released fan clutch. 4,425,993, Cl. 192-85.00A.

Schillinger, Rainer: *See—*
Knapp, Heinrich; and Schillinger, Rainer, 4,425,887, Cl. 123-339.000.

Schinkoth, Gerhard: *See—*
Hage, Manfred; and Schinkoth, Gerhard, 4,425,942, Cl. 138-38.000.

Schlosser, Wolfgang O. W.: *See*—
DiLorenzo, James V.; Hwang, James C.; Niehaus, William C.; Schlosser, Wolfgang O. W.; and Wemple, Stuart H., 4,426,656, Cl. 357-22.000.

Schluchter, Martin; and Voser, Max, to BBC Brown, Boveri & Company, Limited. Bearing support arrangement for electrical machines. 4,426,163, Cl. 384-428.000.

Schmid, Gunther: *See*—
Fritzenwenger, Josef A.; Probst, Martin; and Schmid, Gunther, 4,425,877, Cl. 123-41.100.

Schmidt, Hans-Friedrich: *See*—
Quella, Ferdinand; and Schmidt, Hans-Friedrich, 4,426,368, Cl. 423-445.000.

Schmidt, Raymond L.: *See*—
Simon, Ralph; and Schmidt, Raymond L., 4,425,810, Cl. 73-863.110.

Schmitt, Helmut; Schurig, Helmuth; and Strasser, Bernd, to UHDE GmbH. Monopolar filter-press electrolyzer. 4,426,270, Cl. 204-257.000.

Schnebly, Eugene L. Log splitting apparatus. 4,425,950, Cl. 144-194.000.

Schneider, Ernst: *See*—
Heise, Klaus-Peter; Schneider, Ernst; and Wedemeyer, Karlfried, 4,426,538, Cl. 564-417.000.

Schneider, Johann: *See*—
Wusthof, Peter; and Schneider, Johann, 4,426,199, Cl. 418-61.00B.

Schneider, Siegfried: *See*—
Kuemmel, Klaus; Klapettek, Gerhard; and Schneider, Siegfried, 4,426,149, Cl. 355-8.000.

Scholz, Manfred; Fricker, Wolfgang-Peter; and Gollasch, Bernd, to Kraftwerk Union Aktiengesellschaft; and Grunzweig & Hartmann Montage GmbH. Heat insulation for dome-shaped bottom and/or cover region of a pressure vessel. 4,425,963, Cl. 165-104.320.

Schossler, Willi: *See*—
Behre, Horst; Blank, Heinz U.; Lindner, Otto; and Schossler, Willi, 4,426,334, Cl. 260-509.000.

Schreier, Peter: *See*—
Drawert, Friedrich; Schreier, Peter; and Kramer, Gabriele, 4,426,210, Cl. 55-73.000.

Schroeder Brothers Corporation: *See*—
Mitchell, Samuel S.; and Vijlee, Abbas F., 4,426,284, Cl. 210-90.000.

Schumacher, Ignatius; and Wang, Kang-Bo, to Monsanto Company. Vapor phase nitration of aromatic hydrocarbons. 4,426,543, Cl. 568-940.000.

Schumacher, Johannes A.: *See*—
Andreev, Borislav; and Schumacher, Johannes A., 4,425,789, Cl. 73-40.50R.

Schurig, Helmuth: *See*—
Schmitt, Helmut; Schurig, Helmuth; and Strasser, Bernd, 4,426,270, Cl. 204-257.000.

Schutz, Bernard R., to Fine Art Pillow & Specialties Corp. Cover for seat of a collapsible stroller. 4,426,113, Cl. 297-219.000.

Schwartz, Craig A., to Minnesota Mining and Manufacturing Company. Paper treatment compositions containing fluorochemical carboxylic acid and epoxidic cationic resin. 4,426,466, Cl. 523-455.000.

Schwenke, Joachim; Knoth, Joachim; Marten, Rainer; and Rosomm, Herbert, to Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH. Measuring apparatus for X-ray fluorescence analysis. 4,426,717, Cl. 378-45.000.

SCM Corporation: *See*—
Whitman, Charles I., 4,426,598, Cl. 313-331.000.

Scott, Harvey. Paper holding and displaying device. 4,425,724, Cl. 40-11.00A.

Scragg, Robert L.; and Parker, Alfred B., to Solar Reactor Corporation. Power generator system for HCl reaction. 4,426,354, Cl. 376-320.000.

Scypinski, Stephen: *See*—
Wernick, David L.; and Scypinski, Stephen, 4,426,292, Cl. 210-635.000.

Seaboard CoastLine Railroad Co.: *See*—
Spivey, Paul B., 4,426,116, Cl. 301-9.00R.

Seager, Richard H.: *See*—
Grendol, Clark L.; and Seager, Richard H., 4,425,669, Cl. 2-436.000.

Seal, J. David, to Autotrol Corporation. Microcomputer controlled demand/scheduled water softener. 4,426,294, Cl. 210-662.000.

Sealed Air Corporation: *See*—
Sperry, Charles R.; and Riley, Harry F., 4,426,023, Cl. 222-132.000.

Seaquist Valve Co.: *See*—
Knickerbocker, Michael G., 4,426,025, Cl. 222-182.000.

Seaquist Valve Co., Div. of Pittway Corp.: *See*—
Knickerbocker, Michael G., 4,426,026, Cl. 222-402.130.

Sears, Barry D., to Lipid Specialties, Inc. Synthetic phospholipid compounds. 4,426,330, Cl. 260-403.000.

Sechet, Claude; Gautier, Christian; and Degoulet, Gabriel, to Etablissement Public de Diffusion dit "Telediffusion de France"; and L'Etat Francais, represente par le Secretaire d'Etat aux Postes et Telecommunications et a la Telediffusion (Centre National d'Etudes des Telecommunications). Scratch pad memory for cassette of magnetic tape recording. 4,426,684, Cl. 364-900.000.

Sedam, Jason K., to Coca-Cola Company, The. Membrane seal and knife combination for a post-mix beverage dispensing system. 4,426,019, Cl. 222-88.000.

Seeling, Alfred: *See*—
Hese, Nils; Seeling, Alfred; and Weisweiler, Manfred, 4,426,204, Cl. 8-492.000.

Sei, Kazuo: *See*—
Inoue, Hiroshi; Isoi, Masaaki; and Sei, Kazuo, 4,426,498, Cl. 525-240.000.

Seif, Rudolf: *See*—
Kreiner, Hans-Jurg; Seif, Rudolf; and Zimmer, Wilhelm, 4,426,581, Cl. 250-380.000.

Seifert, Rolf; Zimmet, Hans; Welzel, Herbert; and Reschke, Lothar, to VEB Pentacon Dresden Kamera und Kinowerke. Focal-plane leaf shutter. 4,426,146, Cl. 354-246.000.

Seksui Kaseihin Kogyo Kabushiki Kaisha: *See*—
Komatsuzaki, Nobuyuki; Tsubone, Masahiro; and Machida, Bon, 4,426,065, Cl. 264-45.900.

Sen, Rajat K.: *See*—
Hardee, Kenneth L.; Gordon, Arnold Z.; Pyle, Charles B.; and Sen, Rajat K., 4,426,263, Cl. 204-101.000.

Senoh Kabushiki Kaisha: *See*—
Fujisaki, Iwao; Kosuge, Shuichi; Ogawa, Syuu; Sato, Kimihiko; and Soeda, Toshimi, 4,425,921, Cl. 128-690.000.

Senoo, Tetsuo, to Nissan Motor Company, Limited. Vehicle loudspeaker arrangement with magnetic-field-sensitive device. 4,426,553, Cl. 179-117.000.

Serra Bou, Francisco. Process for obtaining revolving bodies for construction from aggregates and a binder. 4,426,345, Cl. 264-256.000.

Serrano, Jean-Pierre: *See*—
Denoyer, Serge; Guerin, Jacques; Labrot, Maxime; and Serrano, Jean-Pierre, 4,426,597, Cl. 313-231.410.

Sghibartz, Cristian M., to International Paint Public Limited Company. Marine paint. 4,426,464, Cl. 523-122.000.

Shackelford, Scott A.; McGuire, Raymond R.; and Cochoy, Robert E., to United States of America, Air Force. Synthesis of vinyl ethers. 4,426,540, Cl. 568-590.000.

Shadday, Michael C.; and Wilber, Dennis A., to Cummins Engine Company, Inc. Internal combustion engine fan drive. 4,425,879, Cl. 123-41.120.

Shah, Hasmukh: *See*—
Hof, Craig R.; and Shah, Hasmukh, 4,425,998, Cl. 206-306.000.

Shank, Joseph L., to DynaGel, Incorporated. Preparation of hydrolyzed collagen-containing products from non-gelled, liquid hydrolyzed collagen concentrate and gelled products prepared therefrom. 4,426,443, Cl. 430-538.000.

Shanley, Robert L., II: *See*—
Harwood, Leopold A.; and Shanley, Robert L., II, 4,426,625, Cl. 330-254.000.

Shape Inc.: *See*—
Gelardi, Anthony L.; Gelardi, Paul J.; and MacLeod, Robert B., Jr., 4,426,056, Cl. 248-225.100.

Shapiro, Anatoly S.; Kalashnikov, Leonid F.; Leontiev, Nikolai I.; Polyakov, Vladimir I.; and Steblevsky, Anatoly A. Vane pump. 4,426,190, Cl. 415-74.000.

Shapiro, Richard G., to Thatcher Glass Corporation. Coating hood. 4,425,868, Cl. 118-314.000.

Sharangpani, Shrikishna G.; and Spence, Floyd G., to BASF Wyandotte Corporation. Solvent extraction of nitrated organic compounds from aqueous solutions. 4,426,291, Cl. 210-634.000.

Sharp Kabushiki Kaisha: *See*—
Ataka, Yasukazu; Ikezaki, Katuzi; and Umeda, Katsuhiko, 4,426,211, Cl. 55-296.000.
Funada, Fumiaki; Minezaki, Shigehiro; Kozaki, Syuichi; and Uede, Hisashi, 4,426,133, Cl. 350-334.000.

Shaw, Rudy L.: *See*—
Tsui, James B. Y.; and Shaw, Rudy L., 4,426,648, Cl. 343-18.00E.

Sheesley, Donald L.; and Campbell, Willis R., to Sperry Corporation. Baling machine with roller-type floor. 4,425,752, Cl. 56-341.000.

Shell Oil Company: *See*—
Drent, Eit, 4,426,331, Cl. 260-463.000.
Shepley, John D., 4,426,298, Cl. 252-8.900.
Wood, Donald L.; and Zweig, Judith E., 4,426,254, Cl. 162-72.000.

Shelley, Lisbeth E.: *See*—
Evans, Deborah A.; and Shelley, Lisbeth E., 4,426,295, Cl. 210-772.000.

Shelton, Gerald L.: *See*—
Hierholzer, Frank J., Jr.; and Shelton, Gerald L., 4,426,405, Cl. 427-50.000.

Shepley, John D., to Shell Oil Company. Textile processing oils. 4,426,298, Cl. 252-8.900.

Sheridan, John J. Head positioning device. 4,426,138, Cl. 351-158.000.

Shibata, Takanori: *See*—
Fukushima, Toshihiko; Miyamoto, Seigo; Kawashima, Kenichi; Kawabata, Toshiaki; Tani, Seijiro; and Shibata, Takanori, 4,425,765, Cl. 62-133.000.

Shibata, Zenichi: *See*—
Sudo, Masatoshi; Hori, Hiromi; Tsukatani, Ichiro; and Shibata, Zenichi, 4,426,235, Cl. 148-12.00C.

Shiga, Masao: *See*—
Tsuchiya, Keiichi; Hisano, Katsukuni; Tan, Toshimi; Kobayashi, Masahiro; Kobayashi, Kei; Ueda, Kazuhiko; Kirihara, Seishin; Yoshioka, Takatoshi; and Shiga, Masao, 4,426,162, Cl. 384-280.000.

Shih, Chung: *See*—
Alexander, Jose; and Shih, Chung, 4,426,391, Cl. 424-301.000.

Shima, Tsukasa: *See*—
Nakamae, Kenji; and Shima, Tsukasa, 4,426,421, Cl. 428-234.000.

Shimada, Katsutoshi: *See*—
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, 4,426,521, Cl. 544-146.000.

Shimano Industrial Company Limited: *See*—
Shimano, Keizo, 4,425,819, Cl. 74-489.000.
Shimano, Keizo, to Shimano Industrial Company Limited. Control lever device for a bicycle. 4,425,819, Cl. 74-489.000.
Shimizu, Kazuyuki; and Koshino, Minoru, to Fujitsu Limited. Synchronizing circuit. 4,426,713, Cl. 375-106.000.
Shimizu, Takao: *See*—
Ukena, Toshimichi; Narumi, Hiroshi; Shimizu, Takao; and Nagashima, Atsushi, 4,426,266, Cl. 204-206.000.
Shimizu, Tasuku: *See*—
Hayashi, Makoto; Sakata, Shinji; and Shimizu, Tasuku, 4,426,718, Cl. 378-072.000.
Shimizu, Toru: *See*—
Shinozaki, Kichitaro; Sato, Kiyoshi; and Shimizu, Toru, 4,425,774, Cl. 72-257.000.
Shimme, Kaoru; Aoki, Takeo; and Taga, Masayuki, to Sumitomo Kinzoku Kogyo Kabushiki Gaisha. Lance for powder top-blow refining and process for decarburizing and refining steel by using the lance. 4,426,224, Cl. 75-49.000.
Shimotsuma, Wataru: *See*—
Hotta, Shu; Hosaka, Tomiharu; Shimotsuma, Wataru; and Kishimoto, Yoshio, 4,426,546, Cl. 136-256.000.
Shinano Kikaku Co., Ltd.: *See*—
Hashiya, Minoru, 4,426,135, Cl. 350-422.000.
Shinozaki, Kichitaro; Sato, Kiyoshi; and Shimizu, Toru, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Extrusion forging method therefor. 4,425,774, Cl. 72-257.000.
Shiozaki, Yasumi: *See*—
Yamada, Koichi; Harato, Takuo; Kato, Hisakatsu; and Shiozaki, Yasumi, 4,426,363, Cl. 423-121.000.
Shiozawa, Kazuo; and Sawano, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Means for controlling an interchangeable lens type camera. 4,426,147, Cl. 354-286.000.
Shirahashi, Kazuo: *See*—
Oritsuki, Ryoji; Watanabe, Tohru; Shirahashi, Kazuo; Kanai, Hiromi; and Odawara, Kozo, 4,426,548, Cl. 174-72.00R.
Shirakura, Sachiko; and Namiki, Hiroo, to Helene Curtis Industries, Inc. Neutralizer for permanent wave. 4,426,376, Cl. 424-71.000.
Shoher, Itzhak; and Whiteman, Aaron, to Etablissement Dentair Ivoclar. Preparation of an intermediate layer between a high-melting dental metal alloy and dental porcelain. 4,426,404, Cl. 427-2.000.
Shrive, Nigel G.: *See*—
Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; Shrive, Nigel G.; and Raymont, Michael E. D., 4,426,456, Cl. 501-84.000.
Shtefan, Vladimir N.: *See*—
Kiselnikov, Valentin N.; Shubin, Arkady A.; Vyalkov, Vladislav V.; Kruglov, Vitaly A.; Loginova, Tamara F.; Romanov, Viktor S.; Ovchinnikov, Lev N.; Varlamov, Valentin I.; Makarov, Jury A.; Penkov, Evgeny I.; Shvareva, Galina N.; and Shtefan, Vladimir N., 4,426,507, Cl. 526-303.100.
Shubin, Arkady A.: *See*—
Kiselnikov, Valentin N.; Shubin, Arkady A.; Vyalkov, Vladislav V.; Kruglov, Vitaly A.; Loginova, Tamara F.; Romanov, Viktor S.; Ovchinnikov, Lev N.; Varlamov, Valentin I.; Makarov, Jury A.; Penkov, Evgeny I.; Shvareva, Galina N.; and Shtefan, Vladimir N., 4,426,507, Cl. 526-303.100.
Shvareva, Galina N.: *See*—
Kiselnikov, Valentin N.; Shubin, Arkady A.; Vyalkov, Vladislav V.; Kruglov, Vitaly A.; Loginova, Tamara F.; Romanov, Viktor S.; Ovchinnikov, Lev N.; Varlamov, Valentin I.; Makarov, Jury A.; Penkov, Evgeny I.; Shvareva, Galina N.; and Shtefan, Vladimir N., 4,426,507, Cl. 526-303.100.
Siecor Corporation: *See*—
Davis, Lawrence E.; and Patel, Naren I., 4,426,230, Cl. 106-272.000.
Siemens AG: *See*—
Neumann, Leopold; Kline, Richard B., II; and McMorrow, Richard H., Jr., 4,426,644, Cl. 340-720.000.
Siemens Aktiengesellschaft: *See*—
Baer, Ulrich; Distler, Walter; and Grassmann, Peter, 4,426,715, Cl. 378-4.000.
Dietze, Wolfgang, 4,426,408, Cl. 427-95.000.
Friedel, Rudolf, 4,426,720, Cl. 378-93.000.
Irro, Otmar, 4,426,165, Cl. 400-57.000.
Muether, Manfred; and Behne, Ernest-August, 4,426,716, Cl. 378-38.000.
Quella, Ferdinand; and Schmidt, Hans-Friedrich, 4,426,368, Cl. 423-445.000.
SIG Schweizerische Industrie-Gesellschaft: *See*—
Steinbrecher, Luigi, 4,426,605, Cl. 318-347.000.
Sigri Elektrographit GmbH: *See*—
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Simmonds Precision Products, Inc.: *See*—
Maier, Lawrence C., 4,426,616, Cl. 324-57.00R.
Simmons, George. Spark plug boot remover. 4,425,697, Cl. 29-280.000.
Simmons, Gerald C.: *See*—
Banks, Eddie D.; Simmons, Gerald C.; and Roberts, Roger F., 4,426,051, Cl. 244-137.00R.
Simon, Morris, to Beth Israel Hospital. Blood clot filter. 4,425,908, Cl. 128-1.00R.
Simon, Ralph; and Schmidt, Raymond L., to Chevron Research Company. Apparatus for physical properties measurements at high temperatures and pressures. 4,425,810, Cl. 73-863.110.
Simonovitch, Chaim, to ABIC Ltd. Hexahydro-1,2,4-triazine-3,5 dione derivatives. 4,426,522, Cl. 544-182.000.
Simoons, John R. A.: *See*—
Wyburn-Mason, Roger, 4,426,384, Cl. 424-253.000.
Sinha, Rajiv: *See*—
Riffe, Josephus; and Sinha, Rajiv, 4,426,682, Cl. 364-200.000.
Sirkkola, Erkki; and Kotilainen, Heikki, to Valtion Teknillinen Tutkimuslaitos. Method and apparatus for impact testing of bend specimen. 4,425,786, Cl. 73-12.000.
Skerlos, Peter C.; and Zato, Thomas J., to Zenith Radio Corporation. IR Remote control detector/decoder. 4,426,662, Cl. 358-194.100.
Skiba, Edwin J.: *See*—
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Skinner, Dean W.: *See*—
Carrington, James E.; Hryck, Michael D.; Skinner, Dean W.; and Westcott, Gerald R., 4,425,844, Cl. 101-93.140.
Skrobisch, Alfred, to Staver Company, Inc., The. Rotor for electromagnetic indicator. 4,425,864, Cl. 116-204.000.
Sliger, Boyd P., to Robertshaw Controls Company. Valve construction and method of making the same. 4,426,036, Cl. 236-34.500.
Small, Clifford: *See*—
Ray, Cole; Vincent, John; and Small, Clifford, 4,425,914, Cl. 128-200.140.
Smilgys, Bruno S., to Veeder Industries Inc. Fuel pump counter readout. 4,426,574, Cl. 235-1.00C.
Smith, J. Harold: *See*—
Goller, Glen J.; Breault, Richard D.; and Smith, J. Harold, 4,426,340, Cl. 264-29.100.
Smith, Jay E., to United States of America, Energy. Detection device. 4,426,580, Cl. 250-374.000.
Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Sach, George S., 4,426,526, Cl. 546-300.000.
Smith, Lewis L. Adjustable aerating shower head. 4,426,040, Cl. 239-428.500.
Smith & Loveless, Inc.: *See*—
Mason, Donald G.; and Weis, Frank G., 4,426,293, Cl. 210-636.000.
Smith, Samuel C. Automobile rain shield. 4,426,111, Cl. 296-95.00R.
Smith, Stuart B., to Thermocell Development, Ltd. Modified polyisocyanurate foam and method of preparation. 4,426,461, Cl. 521-116.000.
Smith, William J. Coin sorting and counting apparatus. 4,425,927, Cl. 133-8.00A.
Snyder, Clair W., Jr.: *See*—
Ritchie, Leon T.; Snyder, Clair W., Jr.; and Woratyla, John A., 4,426,123, Cl. 339-75.0MP.
Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Lajotte, Dominique; and Menet, Francis, 4,426,730, Cl. 381-46.000.
Nouet, Christian, 4,426,587, Cl. 307-66.000.
Societe de Vente de l'Aluminium Pechiney: *See*—
Gimond, Jacques; Gonda, Richard; Hicter, Jean-Marie; and Laty, Pierre, 4,426,068, Cl. 266-217.000.
Societe d'Etudes de Thermiques S.E.M.T.: *See*—
Bastenhof, Dirk; Brisson, Roger; and Bonniot, Claude, 4,426,198, Cl. 417-494.000.
Societe Nationale Elf Aquitaine (Prod.): *See*—
Fournie, Rene; Besnard, Francois; Hons-Olivier, Jacques; and Pierre, Alexandre, 4,426,086, Cl. 277-1.000.
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Chenin, Claude; Krawczyk, Rodolphe; Marello, Georges; and Lombard, Jean-Yves, 4,426,053, Cl. 244-173.000.
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Soeda, Toshimi: *See*—
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Sokola, Raymond L.: *See*—
D'Avello, Robert F.; and Sokola, Raymond L., 4,426,631, Cl. 333-202.000.
Solar Reactor Corporation: *See*—
Scragg, Robert L.; and Parker, Alfred B., 4,426,354, Cl. 376-320.000.
Solmat Systems Ltd.: *See*—
Saraf, Israel E., 4,425,787, Cl. 73-32.00R.
Somerville, Richard C., to Globe Rubber Works, Inc. Self-adjusting roller and method of use. 4,425,694, Cl. 29-110.000.
Sommer, Oswin; Dorsch, Norman; Bosch, Erhard; Schiller, August; and Strasser, Alois, to Wacker-Chemie GmbH. Organopolysiloxane compositions and elastomers formed therefrom. 4,426,474, Cl. 524-243.000.
Sommerfeld, Eugene G.: *See*—
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Sony Corporation: *See*—
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Motoyama, Tadashi, 4,426,690, Cl. 369-45.000.
Motoyama, Tadashi, 4,426,690, Cl. 369-45.000.
Nagumo, Fumio; and Takeshita, Kaneyoshi, 4,426,664, Cl. 358-213.000.
Okada, Takashi; and Tanaka, Yutaka, 4,426,661, Cl. 358-140.000.
Soukup, Robert J.: *See*—
Cyronak, Matthew J.; Zanno, Paul R.; and Soukup, Robert J., 4,426,403, Cl. 426-535.000.
Southworth, Elaine D.: *See*—
Southworth, William W.; and Southworth, Elaine D., 4,425,706, Cl. 30-116.000.

Southworth, William W.; and Southworth, Elaine D. Cutting tool. 4,425,706, Cl. 30-116.000.
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Spence, Floyd G.: *See—*
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Spence, Gavin G.: *See—*
Maslanka, William W.; and Spence, Gavin G., 4,426,483, Cl. 524-460.000.
Sperry, Charles R.; and Riley, Harry F., to Sealed Air Corporation. Cleaning assembly for a foam dispensing apparatus. 4,426,023, Cl. 222-132.000.
Sperry Corporation: *See—*
Beck, Ronald A., 4,426,571, Cl. 219-373.000.
Black, Homer D.; and Stribley, Charles R., 4,426,607, Cl. 318-628.000.
Butler, L. Dennis, 4,426,183, Cl. 414-24.500.
Freimuth, John H., 4,425,753, Cl. 56-341.000.
Martenas, Wayne B., 4,426,043, Cl. 241-101.200.
Sheesley, Donald L.; and Campbell, Willis R., 4,425,752, Cl. 56-341.000.
Wilkens, Dean R.; Harned, Dan B.; and Hawn, Norman W., 4,426,623, Cl. 329-178.000.
Spivey, Paul B., to Seaboard CoastLine Railroad Co. Tire rim and spoke arrangement to discourage tire theft. 4,426,116, Cl. 301-9.00R.
Sponseller, Harold P., to Harold Sponseller and Associates, Inc. Apparatus and method for testing tube welds. 4,425,802, Cl. 73-827.000.
Sporlan Valve Company: *See—*
Barbier, William J., 4,425,767, Cl. 62-212.000.
Sprague Electric Company: *See—*
Gontowski, Walter S., Jr., 4,426,658, Cl. 357-48.000.
Nagy, Bela G.; and Saab, Alfredo H., 4,426,609, Cl. 318-729.000.
Spronken, Eugene N. M., to Spronken Orthopedie. Walking sole. 4,425,721, Cl. 36-11.500.
Spronken Orthopedie: *See—*
Spronken, Eugene N. M., 4,425,721, Cl. 36-11.500.
Stackhouse, Donald C.: *See—*
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Stadelman, William J.: *See—*
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Stage, Hermann. Method and apparatus for the desalination of crude tall oil. 4,426,322, Cl. 260-97.700.
Stahl, Edward L.; and Kreeger, Elsmer W., to Pinckney Molded Plastics, Inc. Nestable and stackable container. 4,426,001, Cl. 206-507.000.
Standard-Knapp, Inc.: *See—*
Flanagan, Thomas L., 4,426,034, Cl. 229-23.0BT.
Standard Oil Company, The: *See—*
Dria, Dennis E.; and Bremer, Noel J., 4,426,342, Cl. 264-109.000.
Standard Oil Company (Indiana): *See—*
Hoekstra, Gerald B., deceased, 4,425,967, Cl. 166-259.000.
Lee, Richard J.; and Murphy, Lynn M. R., 4,426,306, Cl. 252-51.50A.
Palm, John W., 4,426,369, Cl. 423-574.00R.
Zacher, Harold D., 4,426,212, Cl. 55-345.000.
Star, Leon D. Mobile hospital unit. 4,425,978, Cl. 180-243.000.
Staubly Ralph F.: *See—*
Wood, Geraldine E.; and Staubly Ralph F., 4,425,711, Cl. 30-324.000.
Staver Company, Inc., The: *See—*
Skrobisch, Alfred, 4,425,864, Cl. 116-204.000.
Stavropoulos, Constantine N., to Engineering Resources, Inc. Condensate removal device for steam lines and the like. 4,426,213, Cl. 55-466.000.
Steag Aktiengesellschaft: *See—*
Gratz, Johannes; and Kerstges, Ferdinand, 4,425,745, Cl. 52-235.000.
Heyn, Klaus; and Pogrzeba, Hans J., 4,425,757, Cl. 60-39.182.
Steblevsky, Anatoly A.: *See—*
Shapiro, Anatoly S.; Kalashnikov, Leonid F.; Leontiev, Nikolai I.; Polyakov, Vladimir I.; and Steblevsky, Anatoly A., 4,426,190, Cl. 415-74.000.
Steckler, Robert, to Plastomedical Sciences, Inc. Disposable, hydrogel soft contact lenses. 4,426,492, Cl. 525-61.000.
Steen, Harald B., to Ernst Leitz Wetzlar GmbH. Liquid flow photometer. 4,426,154, Cl. 356-73.000.
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Steigerwald, Robert L.; Kornrumpf, William P.; and Walden, John P., to General Electric Company. Parallel resonant induction cooking surface unit. 4,426,564, Cl. 219-10.770.
Stein, Myron. Fluid injection system. 4,425,937, Cl. 137-480.000.
Steinberg, Richard W., to Hiniker Company. Split ring spring for earth working tool. 4,425,972, Cl. 172-551.000.
Steinbrecher, Luigi, to SIG Schweizerische Industrie-Gesellschaft. Method of operating a shunt-wound DC motor as well as controlling device for the execution and application thereof. 4,426,605, Cl. 318-347.000.
Stephens, Donn E., to Bausch & Lomb Incorporated. Refractor suspension system. 4,426,140, Cl. 351-204.000.
Sterner, Eric, to Telefonaktiebolaget L M Ericsson. Wire wrapping tool. 4,425,948, Cl. 140-119.000.
Stevens, James L., to U.S. Philips Corporation. Preparation of aluminum electrolytic capacitor foil. 4,426,260, Cl. 204-33.000.
Stevison, Donald F.; and Rolinski, Edmund J., to United States of America, Air Force. Double electric discharge coaxial laser. 4,426,705, Cl. 372-58.000.
Stewart, Donald M. Dual propeller and engine drive system for aircraft. 4,426,049, Cl. 244-69.000.
Stichting Research en Techniek van de Katholieke Universiteit: *See—*
van Etteger, Albert F., 4,426,708, Cl. 372-103.000.
Stiegeler, Arthur: *See—*
Ottow, Alexander B.; Stiegeler, Arthur; and Tjaden, Jan, 4,426,401, Cl. 426-394.000.
Stirling, Irene; and Clarke, Brian P., to Beecham Group Limited. Derivatives of clavulanic acid, a process for their preparation and their use. 4,426,389, Cl. 424-272.000.
Stock, David K.; and Wech, Robert J., to Amplas, Inc. Intermittent rotational drive. 4,425,988, Cl. 192-18.00R.
Stoewe, Anneliese; and Hegner, Gunter, to Krone GmbH. Plug for masking switching contacts. 4,426,121, Cl. 339-38.000.
Stokes, Edward M. Lighter-than-air ball game apparatus. 4,426,080, Cl. 273-118.00A.
Stoll, Ulrich W. Device and procedure for measuring in situ strength of concrete and the like. 4,425,801, Cl. 73-803.000.
Stone & Webster Engineering Corp.: *See—*
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Stribley, Charles R.: *See—*
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Conti, James C.; Strope, Elaine; Findl, Eugene; and Griffiths, Cynthia, 4,425,922, Cl. 128-691.000.
Stull, W. John. Flexible airduct and deflector system. 4,425,839, Cl. 98-40.00R.
Suda, Seiji: *See—*
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Sudo, Masatoshi; Hori, Hiromi; Tsukatani, Ichiro; and Shibata, Zenichi, to Kabushiki Kaisha Kobe Seiko Sho. Cold-rolled high strength steel plate with composite steel structure of high r-value and method for producing same. 4,426,235, Cl. 148-12.00C.
Sueishi, Motoharu: *See—*
Yoshida, Shuzo; Ono, Hironobu; Matsuo, Masashi; Hoshi, Kouich; Sueishi, Motoharu; and Ueda, Kazuo, 4,425,895, Cl. 123-489.000.
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Sugimoto, Masahiro: *See—*
Abiru, Akira; Sugimoto, Masahiro; and Inomata, Juro, 4,426,657, Cl. 357-29.000.
Sugino, Kazuo; Kageyama, Hideaki; and Masumoto, Hiroki, to Nippon Steel Corporation. Method for manufacturing high strength rail of excellent weldability. 4,426,236, Cl. 148-36.000.
Sugiura, Noboru: *See—*
Kashimura, Yuichi; Suda, Seiji; and Sugiura, Noboru, 4,425,891, Cl. 123-425.000.
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Sulphur Development Institute of Canada (SUDIC): *See—*
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Sumitomo Aluminium Smelting Company, Ltd.: *See—*
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Sumitomo Chemical Company Limited: *See—*
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Sumitomo Durez Company, Ltd.: *See*—
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Sumitomo Kinzoku Kogyo Kabushiki Gaisha: *See*—
Shimme, Kaoru; Aoki, Takeo; and Taga, Masayuki, 4,426,224, Cl. 75-49.000.

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Sundstrand Corporation: *See*—
Poliman, Frederic W., 4,426,194, Cl. 417-218.000.

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Suzuki, Toshiyuki; Matsumura, Funiaki; Maeda, Hiroshi; Imai, Akira; and Kurokawa, Nobuo, to Morishita Jintan Company, Limited. Method for producing seamless material-filled capsule and miniature capsules. 4,426,337, Cl. 264-4.000.

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Murakami, Hiromi; Suzuki, Masato; and Suzuki, Tutomu, 4,425,702, Cl. 29-606.000.

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Svehaug, Henry V. Rotary screen liquid-solid separator. 4,426,289, Cl. 210-403.000.

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Swanson, Lynwood W.: *See*—
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Swedo, Raymond J., to UOP Inc. Preparation of surfactants by sulfonating derivatives of depolymerized coal. 4,426,313, Cl. 252-353.000.

Swozil, Adolf, to Sigri Elektrographit GmbH. Connecting rod of a composite material and method for manufacturing the same. 4,425,820, Cl. 74-579.00R.

Syngas Company: *See*—
Lasoski, Bernard A., 4,426,452, Cl. 436-76.000.

Szilagyi, Ferenc, to Rhone- Poulenc Industries. Process for the treatment of aqueous effluents containing organic substances and inorganic salts and apparatus for use therein. 4,425,856, Cl. 110-346.000.

Tachikawa, Hajime; and Ishihara, Masahiro, to Hitachi Heating Appliances Co., Ltd. Heating apparatus with char detecting and heating control unit. 4,426,572, Cl. 219-502.000.

Tacker, Willis A., Jr.: *See*—
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Tada, Shinichi: *See*—
Matsumura, Shingo, deceased; Kise, Masahiro; Ozaki, Masakuni; Tada, Shinichi; Kazuno, Kenji; Watanabe, Hisao; Kunimoto, Katsutoshi; and Tsuda, Masami, 4,426,381, Cl. 424-250.000.

Tadokoro, Tomoo; Hayama, Nobuhiro; and Akagi, Toshimichi, to Toyo Kogyo Co., Ltd. Intake means for two-rotor type rotary piston engines. 4,425,883, Cl. 123-242.000.

Taga, Masayuki: *See*—
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Tague, Steven A.; and Negi, Virendra S., to Honeywell Information Systems Inc.; and Honeywell Information Systems Inc. Data processor using read only memories for optimizing main memory access and identifying the starting position of an operand. 4,426,680, Cl. 364-200.000.

Taiho Industries Co. Ltd.: *See*—
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Takenaka, Akira; and Fukuoka, Tatsuhiko, 4,426,089, Cl. 277-27.000.

Takahashi, Hitoshi: *See*—
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Takahashi, Ken; and Youda, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Methods of making magnetic recording heads. 4,425,701, Cl. 29-603.000.

Takahei, Kenichiro: *See*—
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Takehara, Hideaki, to Victor Company of Japan, Limited. Stylus for detecting signals recorded as geometric variations and method for making the same. 4,426,660, Cl. 358-126.000.

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Takenaka, Akira; and Fukuoka, Tatsuhiko, to Taiho Kogyo Co., Ltd. Dust-proof device for mechanical seal. 4,426,089, Cl. 277-27.000.

Takeshita, Kaneyoshi: *See*—
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Takezawa, Keiji, to Alps Electric Co., Ltd. Variable resistor. 4,426,635, Cl. 338-183.000.

Takihara, Yukio: *See*—
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Tamamura, Toshiaki; Imamura, Saburo; Morita, Masao; and Kogure, Osamu, to Nippon Telegraph & Telephone Public Corporation. Method for forming micropattern. 4,426,247, Cl. 156-643.000.

Tamura, Akihiko: *See*—
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Tan, Toshimi: *See*—
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Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; and Nishikawa, Mineki, to Director of the National Institute of Radiological Sciences, Science and Technology Agency, The; and Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for detecting single event. 4,426,699, Cl. 371-68.000.

Tanaka, Katsuyuki: *See*—
Saeki, Yukio; and Tanaka, Katsuyuki, 4,426,484, Cl. 524-541.000.

Tanaka, Masanori; Takihara, Yukio; and Masuda, Toru, to Hosiden Electronics Co., Ltd. Jack having an insulating contact operator. 4,426,558, Cl. 200-51.090.

Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, to Eisai Co., Ltd. Cyanoguanidine derivatives. 4,426,521, Cl. 544-146.000.

Tanaka, Toshiaki; and Ushimura, Shoji, to Nissan Motor Company, Limited. Diesel engine fuel injection device. 4,425,885, Cl. 123-299.000.

Tanaka, Tsuneo: *See*—
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Tanaka, Yasushi: *See*—
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Tani, Seijiro: *See*—
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Tanji, Shigeo: *See*—
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Tarumi, Noriyoshi; Iwahashi, Haruo; Matsunawa, Masahiko; and Tokunaga, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Ion modulating electrode. 4,426,654, Cl. 346-159.000.

Tate, Akiyuki: *See*—
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Taylor, Carl D., to General Electric Company. Luminaire mounting. 4,426,676, Cl. 362-371.000.

Taylor, James M., to Raychem Corporation. Devices containing PTC conductive polymer compositions. 4,426,633, Cl. 338-25.000.

Technicare Corporation: *See*—
Bradcovich, James M.; Wake, Robert H.; Kovacs, Richard M., Jr.; and Pinkstaff, Carlos D., 4,426,578, Cl. 250-363.00S.

Telefonaktiebolaget L M Ericsson: *See*—
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Temptronic Corporation: *See*—
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Terada, Kinji, to Tokuyama Soda Co., Ltd. L-Shaped concrete block and method for constructing a retaining wall by such L-shaped concrete blocks. 4,426,176, Cl. 405-285.000.

Terlecke, Mark J., to Graber Industries, Inc. Vertical blind mechanism. 4,425,956, Cl. 160-168.00R.

Terumo Corporation: *See*—
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Texaco Inc.: *See*—
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Texas Instruments Incorporated: *See*—
Boulanger, Henry J., 4,426,632, Cl. 337-347.000.
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Smith, Stuart B., 4,426,461, Cl. 521-116.000.
Thermon Manufacturing Company: *See*—
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Thiele, Horst: *See*—
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Thies, Peter: *See*—
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Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Einenstein, Stephen E., 4,426,301, Cl. 252-8.900.
Thoemel, Frank; and Hoffmann, Werner, to BASF Aktiengesellschaft. Preparation of resorcinol derivatives. 4,426,332, Cl. 260-465.00F.
Thomas, Eric L.: *See*—
Becconsall, Jack K.; Cramp, John H. W.; Reid, Robert F.; Moore, Reginald C.; Rye, Barry J.; and Thomas, Eric L., 4,426,640, Cl. 340-632.000.
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Thompson, David E., to United States of America, Army. Integrated optical grating device by thermal SiO_2 growth on Si. 4,426,440, Cl. 430-321.000.
Thompson, James L.: *See*—
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Thompson, Lionel R. F.: *See*—
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Thomson-Brandt: *See*—
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Thomson-CSF: *See*—
Huriaa, Alain, 4,426,711, Cl. 375-17.000.
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Thomson, David M. P., to Hoffmann-La Roche Inc. Leucocyte adherence inhibition assay for detection of cancer. 4,426,446, Cl. 435-7.000.
Thouault, Alain; Chapuis, Claude; and Austruy, Georges, to Gaz de France. Submersible device for heating liquids. 4,425,902, Cl. 126-360.00R.
Thring, Robert H.; and Hollis, Terence, to Ricardo Consulting Engineers plc. Catalytic combustion engines. 4,425,884, Cl. 123-272.000.
Tick, Paul A., to Corning Glass Works. Inorganic $NbF_5(TaF_5)$-P_2O_5 electrolytes. 4,426,430, Cl. 429-103.000.
Tip-E-Pak, Inc.: *See*—
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Tjaden, Jan: *See*—
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Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
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Tobias, Herbert A., to Du Pont de Nemours, E. I., and Company. Apparatus for applying toner. 4,425,867, Cl. 118-120.000.
Todisco, Joseph, to Marson Corporation. Hand-held setting tool and method for setting deformable head fasteners. 4,425,782, Cl. 72-391.000.
Toko, Inc.: *See*—
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Tokunaga, Hiroshi: *See*—
Tarumi, Noriyoshi; Iwahashi, Haruo; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,426,654, Cl. 346-159.000.
Tokuno, Masateru, to Rengo Kabushiki Kaisha (Rengo Co., Ltd.). Rolls for use in corrugated fibreboard production system. 4,425,695, Cl. 29-113.00R.
Tokuyama Soda Co., Ltd.: *See*—
Terada, Kinji, 4,426,176, Cl. 405-285.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
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Masuoka, Fujio, 4,426,687, Cl. 365-182.000.
Matsumoto, Hiroshi; and Ogura, Tomoki, 4,426,150, Cl. 355-14.0SH.
Moriki, Takeo; and Fukumitsu, Akira, 4,426,695, Cl. 369-77.200.
Ogura, Ichiro; and Itoh, Ayao, 4,425,805, Cl. 73-861.290.
Ohshima, Jiro; Koshino, Yutaka; Ajima, Takashi; and Yonezawa, Toshio, 4,426,234, Cl. 148-1.500.
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; and Nishikawa, Mineki, 4,426,699, Cl. 371-68.000.
Wakamatsu, Hidekazu; and Kogure, Yoichiro, 4,425,762, Cl. 60-646.000.
Tolbert, Darryl K.: *See*—
Wessling, Ritchie A.; Yats, Larry D.; and Tolbert, Darryl K., 4,426,470, Cl. 524-35.000.
Tomasi, Jean-Pierre, to U.S. Philips Corporation. Radar arrangement for measuring velocity of an object. 4,426,647, Cl. 343-8.000.
Tomitani, Takehiro: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; and Nishikawa, Mineki, 4,426,699, Cl. 371-68.000.
Toray Industries, Inc.: *See*—
Deguchi, Yukichi; Miyaji, Shinichiro; and Kobayashi, Hiroaki, 4,426,479, Cl. 524-430.000.
Torigai, Akiyoshi: *See*—
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Torniainen, Matti J., to Carrier Corporation. Method of manufacturing a high performance heat transfer tube. 4,425,696, Cl. 29-157.3AH.
Tovey, Keith C.; and Carrick, David T., to Amersham International Limited. Assay of vitamin B12. 4,426,455, Cl. 436-505.000.
Toyo Kogyo Co., Ltd.: *See*—
Tadokoro, Tomoo; Hayama, Nobuhiro; and Akagi, Toshimichi, 4,425,883, Cl. 123-242.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Kuramoto, Kenichi; and Nakazawa, Hideaki, 4,426,482, Cl. 524-460.000.
Toyoda, Hideaki, to Komori Printing Machinery Co., Ltd. Structure for securing a cylinder drive gear to the end of a cylinder shaft in a printing machine. 4,425,816, Cl. 74-439.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kato, Keigo; and Kuroiwa, Yoshio, 4,425,899, Cl. 123-549.000.
Katsuno, Mitsuaki; and Moriya, Shigeru, 4,426,102, Cl. 280-804.000.
Yoshida, Shuzo; Ono, Hironobu; Matsuo, Masashi; Hoshi, Kouich; Sueishi, Motoharu; and Ueda, Kazuo, 4,425,895, Cl. 123-489.000.
Traver, Frank J.: *See*—
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Treharne, Timothy J. M.: *See*—
Whittle, Clive R.; Whittle, Mark T.; and Treharne, Timothy J. M., 4,426,399, Cl. 426-265.000.
Trentman, John L.: *See*—
Cole, Robert C.; Gaspar, Richard A.; Stackhouse, Donald C.; and Trentman, John L., 4,426,072, Cl. 270-53.000.
Trippel, Gerhard: *See*—
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Troiani, Nicola; Gozzo, Franco; and Lorusso, Simone, to Montedison S.p.A. Method of protecting useful plants and formulations for use in said method. 4,426,393, Cl. 424-327.000.
Tromel, Kristof W. Continuous casting plant for the horizontal continuous casting of steel. 4,425,961, Cl. 164-440.000.
TRW Inc.: *See*—
Meyers, Robert A.; and Hart, Walter D., 4,426,281, Cl. 209-11.000.
Updike, Stanley H.; Michaels, William A.; and Kuonen, Frederick L., 4,425,882, Cl. 123-90.300.
Tsubone, Masahiro: *See*—
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Tsuchiya, Keiichi; Hisano, Katsukuni; Tan, Toshimi; Kobayashi, Masahiro; Kobayashi, Kei; Ueda, Kazuhiko; Kirihara, Seishin; Yoshioka, Takatoshi; and Shiga, Masao, to Hitachi, Ltd. Rotor shaft. 4,426,162, Cl. 384-280.000.
Tsuda, Masami: *See*—
Matsumura, Shingo, deceased; Kise, Masahiro; Ozaki, Masakuni; Tada, Shinichi; Kazuno, Kenji; Watanabe, Hisao; Kunimoto, Katsutoshi; and Tsuda, Masami, 4,426,381, Cl. 424-250.000.
Tsui, James B. Y.; and Shaw, Rudy L., to United States of America, Air Force. Simultaneous signal detection for IFM receivers by detecting intermodulation products. 4,426,648, Cl. 343-18.00E.
Tsuji, Kiwako: *See*—
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Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; Moriwaki, Masazumi; Mochizuki, Noritaka; Minami, Setsuo; and Matsui, Yoshiya, to Canon Kabushiki Kaisha. Projecting device. 4,426,132, Cl. 350-167.000.
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Tsutsui, Hitoshi: *See*—
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Tsuzuku, Susumu; Kaneda, Aizo; Saeki, Junichi; and Aoki, Masayoshi, to Hitachi, Ltd. Transfer molding method and transfer molding machine. 4,426,341, Cl. 264-40.100.
Tsuzurahara, Mamoru, to Hitachi, Ltd. Magnetron. 4,426,601, Cl. 315-39.510.
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Tults, Juri; and Wine, Charles M., to RCA Corporation. Arrangement useful in a phase locked loop tuning control system for selectively applying an aft voltage in a manner to improve loop stability. 4,426,734, Cl. 455-180.000.
Tupper, Leland C.: *See*—
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Uchiyama, Masaaki: *See*—
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Uchiyama, Takashi: *See*—
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Uffner, William E.; and White, Robert N., to Owens-Corning Fiberglas Corporation. Pressure sensitive adhesives based on asphalt flux. 4,426,419, Cl. 428-290.000.
UHDE GmbH: *See*—
Schmitt, Helmut; Schurig, Helmuth; and Strasser, Bernd, 4,426,270, Cl. 204-257.000.
Ukena, Toshimichi; Narumi, Hiroshi; Shimizu, Takao; and Nagashima, Atsushi, to Kawasaki Steel Corporation. Strip edge overcoating preventing device for continuous electroplating. 4,426,266, Cl. 204-206.000.
Ullrich, Georg J.: *See*—
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UMC Industries, Inc.: *See*—
Ficken, Leonard A.; and Podgorny, Gerald J., 4,426,017, Cl. 221-222.000.
Umeda, Jun-ichi: *See*—
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Umeda, Katsuhiko: *See*—
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Underkoffler, Edwin C., to General Electric Company. Telephone communications device for hearing-impaired person. 4,426,555, Cl. 179-84.00L.
Union Carbide Corporation: *See*—
Cain, Paul A., 4,426,385, Cl. 424-263.000.
Gardner, Hugh C., 4,426,491, Cl. 524-878.000.
Hoy, Kenneth L.; and Hoy, Richard C., 4,426,485, Cl. 524-591.000.
Kamp, Ewald A., 4,426,029, Cl. 225-49.000.
Petty, Herbert E., 4,426,480, Cl. 524-445.000.
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Carlson, Robert G., 4,426,193, Cl. 416-229.00A.
Evans, David W.; and Ginsburg, Arthur P., 4,426,663, Cl. 358-211.000.
Gowan, John G., 4,426,131, Cl. 350-162.200.
Leodolter, Walter, 4,426,032, Cl. 228-157.000.
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Cooley, Harold J.; and Dilanni, Elmo J., 4,426,579, Cl. 250-374.000.
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Malecki, Edmund E.; and Jacobs, Harold, 4,426,628, Cl. 331-96.000.
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National Aeronautics and Space Administration: *See*—
Calfo, Frederick D.; and Lupton, Michael W., 4,425,854, Cl. 110-262.000.
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Nola, Frank J., 4,426,614, Cl. 323-243.000.
Rand, James L., 4,425,808, Cl. 73-862.650.
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U.S. Philips Corporation: *See*—
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Kasperkovitz, Wolfdietrich G., 4,426,735, Cl. 455-222.000.
Limper, Nicolaas H.; and Scheffers, Cornelis J. W. M., 4,426,599, Cl. 313-389.000.
Molenaar, Arian; and Wierenga, Peter E., 4,426,442, Cl. 430-413.000.
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Updike, Stanley H.; Michaels, William A.; and Kuonen, Frederick L., to TRW Inc. Valve rotating device. 4,425,882, Cl. 123-90.300.
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Sacks, Clifford E., 4,426,335, Cl. 260-968.000.
Upmeier, Hartmut. Method of controlling the film thickness of flat films produced in flat film extruder installations. 4,426,239, Cl. 156-64.000.
Urushibara, Masahiro: *See*—
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van Bakel, Bernardus L. M.; van Kooijk, Guillaume P. C.; and Videc, Bernard P., to U.S. Philips Corporation. Measuring of tension and moments in a thin flexible tape. 4,425,809, Cl. 73-862.450.

Vander Mey, John E., to Allied Corporation. Methylene chloride-methane sulfonic acid stripping compositions and methods for using same. 4,426,311, Cl. 252-143.000.
Vandevier, Joseph E., to Hughes Tool Company. Feed through mandrel for submersible pump. 4,426,124, Cl. 339-94.00M.
Vandrish, George, to Pylon Electronic Development Company Ltd. Laminated filters. 4,426,214, Cl. 55-511.000.
van Etteger, Albert F., to Stichting Research en Techniek van de Katholieke Universiteit. Laser device. 4,426,708, Cl. 372-103.000.
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van Kooijk, Guillaume P. C.: *See*—
van Bakel, Bernardus L. M.; van Kooijk, Guillaume P. C.; and Videc, Bernard P., 4,425,809, Cl. 73-862.450.
van Ligten, Raoul F.; and Kee, Yeo K., to Polycore Optical Pte. Ltd. Progressive addition lens. 4,426,139, Cl. 351-169.000.
Van Scoy, Davis A., to Grove Valve and Regulator Company. Modular orifice meter with isolation chamber valve closure. 4,425,806, Cl. 73-861.610.
Van Vleck, Gordon T.: *See*—
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Varco International, Inc.: *See*—
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Veeder Industries Inc.: *See*—
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Verunica, Pierre M., to Colgate-Palmolive Company. Low-irritation shampoo. 4,426,310, Cl. 252-106.000.
Vick, Walter; and Suhrbier, Rolf, to F. H. Schule GmbH. Rice-polishing machine. 4,425,841, Cl. 99-605.000.
Victor Company of Japan, Ltd.: *See*—
Hirata, Atsumi, 4,426,692, Cl. 369-32.000.
Hirata, Atsumi, 4,426,692, Cl. 369-32.000.
Itoh, Kenji, 4,426,668, Cl. 360-73.000.
Itoh, Kenji, 4,426,668, Cl. 360-73.000.
Ohta, Kazuho, 4,426,636, Cl. 338-314.000.
Takehara, Hideaki, 4,426,660, Cl. 358-126.000.
Victor, Johannes J. A. Head rest and sunshade construction. 4,425,675, Cl. 5-440.000.
Victor, Michael. Flow measuring device with constant flow coefficient. 4,425,807, Cl. 73-861.650.
Videc, Bernard P.: *See*—
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Vieth, Wolf R.; and Ryder, Leonard B. Saturated preform and method for preparation thereof. 4,426,427, Cl. 428-542.800.
Vignau, Michel; and Heymes, Rene, to Roussel Uclaf. 7-(2-Amino-4-thiazolyl)-acetamido cephalosporanic acids. 4,426,519, Cl. 544-27.000.
Vijlee, Abbas F.: *See*—
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Vittone, Andrea; and Furia, Edoardo, to Montedison S.p.A.; and Mopiefan S.p.A. Process for producing composite reticular structures. 4,426,343, Cl. 264-147.000.
Vitus, Francis J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., to General Tire & Rubber Company, The. Preparation of star polymers. 4,426,495, Cl. 525-92.000.
Voest-Alpine Aktiengesellschaft: *See*—
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Volkswagenwerk Aktiengesellschaft: *See*—
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Von Mosshaim, Horst E. Collapsible structure. 4,425,929, Cl. 135-102.000.
Voser, Max: *See*—
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Sommer, Oswin; Dorsch, Norman; Bosch, Erhard; Schiller, August; and Strasser, Alois, 4,426,474, Cl. 524-243.000.
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Wadensten, Theodore S. Vibration dampening apparatus for motor actuated eccentric forces. 4,425,813, Cl. 74-87.000.
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Wakamatsu, Hidekazu; and Kogure, Yoichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and system for controlling boiler superheated steam temperature. 4,425,762, Cl. 60-646.000.
Wakatsuki, Noboru: *See*—
Kawaura, Kuninori; Yamada, Sumio; Wakatsuki, Noboru; Ono, Masaaki; Tanji, Shigeo; Fujiwara, Yoshiro; and Yanagisawa, Masanobu, 4,426,595, Cl. 310-313.00D.
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Waldekrantz, Bo. Information board. 4,425,727, Cl. 40-600.000.
Walden, John P.: *See*—
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Wang, Kenneth Y., to Burlington Industries, Inc. Cooling device for ultrasonic horns. 4,426,244, Cl. 156-498.000.
Wang, Shih-Ping, to Diagnostic Information, Inc. X-ray intensifier detector system for x-ray electronic radiography. 4,426,721, Cl. 378-99.000.
Wang, Timothy, to Boeing Company, The. Upper surface blown powered lift system. 4,426,054, Cl. 244-212.000.
Ward, Dean L. Method and apparatus for recycling scrap. 4,426,018, Cl. 222-1.000.
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Bybee, Richard T.; Paulson, Arnold E.; and Warren, Holland D., 4,426,352, Cl. 376-255.000.
Wasson, Daniel A., to IRECO Chemicals. Blasting composition containing particulate oxidizer salts. 4,426,238, Cl. 149-60.000.
Watabe, Yoji; Takeichi, Hideo; and Irako, Koichi, to Bridgestone Tire Co., Ltd. Process for decomposing vulcanized rubber. 4,426,459, Cl. 521-42.000.
Watanabe, Hisao: *See*—
Matsumura, Shingo, deceased; Kise, Masahiro; Ozaki, Masakuni; Tada, Shinichi; Kazuno, Kenji; Watanabe, Hisao; Kunimoto, Katsutoshi; and Tsuda, Masami, 4,426,381, Cl. 424-250.000.
Watanabe, Masaru: *See*—
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Watanabe, Masazumi: *See*—
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Watanabe, Teruko: *See*—
Ichikawa, Toshiji; Watanabe, Teruko; and Asada, Yoshimitsu, 4,426,290, Cl. 210-516.000.
Watanabe, Tohru: *See*—
Oritsuki, Ryoji; Watanabe, Tohru; Shirahashi, Kazuo; Kanai, Hiromi; and Odawara, Kozo, 4,426,548, Cl. 174-72.00R.

Water Refining Company: *See*—
Davis, Stephen H., 4,426,285, Cl. 210-109.000.
Watson, Colin; and Dunn, David J., to Loctite Corporation. Method for coating internal threads of a fastener. 4,426,410, Cl. 427-232.000.
Wean United, Inc.: *See*—
Greenberger, Joseph I.; and Kohring, Frederick C., 4,425,928, Cl. 134-122.00R.
Weaver, Marvin P., to Robertshaw Controls Company. Valve construction having multiple piston means and method of making the same. 4,425,941, Cl. 137-871.000.
Weber, Jakob: *See*—
Heuckelbach, Frederik E.; Weber, Robert; and Weber, Jakob, 4,425,944, Cl. 138-89.000.
Weber, Otto; Ohnsmann, Klaus; and Christ, Ferdinand. Method for assembling consignments. 4,426,189, Cl. 414-786.000.
Weber, Robert: *See*—
Heuckelbach, Frederik E.; Weber, Robert; and Weber, Jakob, 4,425,944, Cl. 138-89.000.
Webster Spring Co., Inc.: *See*—
Garceau, Ronald; and Ramsey, Henry R., 4,426,070, Cl. 267-91.000.
Wech, Robert J.: *See*—
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Wedemeyer, Karlfried: *See*—
Heise, Klaus-Peter; Schneider, Ernst; and Wedemeyer, Karlfried, 4,426,538, Cl. 564-417.000.
Wedlin, Per, to AB Erik Bohlin. Apparatus for lubrication of rails. 4,425,986, Cl. 184-3.200.
Weick, Michael D.: *See*—
Copeland, James L.; Fernholz, Peter J.; Larson, Spencer B.; Salmonson, Duane L.; and Weick, Michael D., 4,426,362, Cl. 422-263.000.
Weigel, Horst: *See*—
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,426,532, Cl. 548-344.000.
Weilenmann, Walter, to Hilti Aktiengesellschaft. Weighting circuit for an electrical torque signal in a drilling machine. 4,426,588, Cl. 307-124.000.
Weis, Frank G.: *See*—
Mason, Donald G.; and Weis, Frank G., 4,426,293, Cl. 210-636.000.
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Weissenfels, Franz; and Engels, Walter, to Dynamit Nobel AG. Method for the preparation of highly absorbent phenolic resin foams. 4,426,462, Cl. 521-116.000.
Weisweiler, Manfred: *See*—
Hese, Nils; Seeling, Alfred; and Weisweiler, Manfred, 4,426,204, Cl. 8-492.000.
Wells, Calvin G.; and Malkowski, Joseph L., to Rockwell International Corporation. Lubrication system for a power take off assembly and a drive shaft therefor. 4,425,817, Cl. 74-467.000.
Wells, Lawrence E., to Varco International, Inc. Suspension of pipe spinner. 4,425,827, Cl. 81-57.190.
Welzel, Herbert: *See*—
Seifert, Rolf; Zimmet, Hans; Welzel, Herbert; and Reschke, Lothar, 4,426,146, Cl. 354-246.000.
Wemple, Stuart H.: *See*—
DiLorenzo, James V.; Hwang, James C.; Niehaus, William C.; Schlosser, Wolfgang O. W.; and Wemple, Stuart H., 4,426,656, Cl. 357-22.000.
Wen-hsiung, Ko: *See*—
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Wen-Jen, Ko; and Wen-hsiung, Ko. Thumbless boxing gloves. 4,425,668, Cl. 2-18.000.
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, to Ciba-Geigy Corporation. Benzofuran-2-ones and pharmaceutical compositions. 4,426,380, Cl. 424-244.000.
Werner, Charles: *See*—
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Werner, Lester W., to B-W Health Products, Inc. Lifting system for adjustable hospital bed. 4,425,673, Cl. 5-64.C00.
Werner, Lester W., to B-W Health Products, Inc. Transmission for adjustable hospital bed. 4,425,674, Cl. 5-68.000.
Wernick, David L.; and Scypinski, Stephen, to Exxon Research and Engineering Co. Process for selective separation of molecular species from mixtures thereof using cyclodextrins. 4,426,292, Cl. 210-635.000.
Wessel, Wolf: *See*—
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Wessling, Ritchie A.; Yats, Larry D.; and Tolbert, Darryl K., to Dow Chemical Company, The. Aqueous method of making reinforced composite material from latex, solid polymer and reinforcing material. 4,426,470, Cl. 524-35.000.
Wessling, Ritchie A.; and Pickelman, Dale M., to Dow Chemical Company, The. Surface active polymeric surfactants containing side chain hydrophobes. 4,426,489, Cl. 524-815.000.
West, Floyd G., to Allis-Chalmers Corporation. Engine balancer. 4,425,821, Cl. 74-604.000.
Westcott, Gerald R.: *See*—
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Western Electric Co.: *See*—
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Western Electric Company, Inc.: *See*—
Bachus, Benson F.; and Dornberger, Georg C. E., 4,426,255, Cl. 162-106.000.
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Westinghouse Electric Corp.: *See*—
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Wetenschappelijk en Technisch Onderzoekacentrum voor Diamant: *See*—
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Whittle, Clive R.; Whittle, Mark T.; and Treharne, Timothy J. M., to Protein Foods (U.K.) Limited. Preparation of a dehydrated pork rind product. 4,426,399, Cl. 426-265.000.
Whittle, Mark T.: *See*—
Whittle, Clive R.; Whittle, Mark T.; and Treharne, Timothy J. M., 4,426,399, Cl. 426-265.000.
Wicker, Thomas H., Jr.: *See*—
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Wicnienski, Michael F.; and Charles, Donald E., to Baxter Travenol Laboratories, Inc. Battery charging and testing circuit. 4,426,612, Cl. 320-39.000.
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Wierenga, Peter E.: *See*—
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Wilber, Dennis A.: *See*—
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Wilkens, Dean R.; Harned, Dan B.; and Hawn, Norman W., to Sperry Corporation. Ripple free amplitude demodulator. 4,426,623, Cl. 329-178.000.
Wilkerson, Forrest W., to Beacon Manufacturing Company. Laminated non-woven fabric. 4,426,414, Cl. 428-102.000.
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Willenbrock, William E., Jr.: *See*—
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Williams, Donald E.; and Robertson, Forrest E., to Acra-Plant, Inc. Trash clearing disc assembly for planters. 4,425,973, Cl. 172-574.000.
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Willing, Robert: *See*—
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Willis, Albert E.; Gould, John M.; Matheney, Jack L.; and Garrett, Harrison, to United States of America, National Aeronautics and Space Administration. D.C. to D.C. converter. 4,426,678, Cl. 363-25.000.
Willis, William; and Chivens, Clyde C., to Hydril Company. Thread gaging apparatus and method. 4,425,715, Cl. 33-199.00R.
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Wilson, Robert B., to Crucible Chemical Company. Diester composition and textile processing compositions therefrom. 4,426,297, Cl. 252-8.600.

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Wissmann, Hans; and Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Process for the preparation of compounds containing carboxylic acid amide groups, in particular or peptides. 4,426,325, Cl. 260-112.50R.

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Wolstersdorf, Otto W., Jr., to Merck & Co., Inc. 5-Benzothiazolesulfonamide derivatives for the topical treatment of elevated intraocular pressure. 4,426,388, Cl. 424-270.000.

Womako Maschinenkonstruktionen GmbH: *See*—
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Wood, Donald L.; and Zweig, Judith E., to Shell Oil Company. Solubilization of nonionic surfactants useful in wood pulp deresination. 4,426,254, Cl. 162-72.000.

Wood, Geraldine E.; and Staubly Ralph F. Double-ended doubly-concaved baby spoon. 4,425,711, Cl. 30-324.000.

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Woratyla, John A.: *See*—
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Wusthof, Peter; and Schneider, Johann, to Mannesmann Rexroth. Rotary fluid actuated machine. 4,426,199, Cl. 418-61.00B.

Wyburn-Mason, Roger, to Simoons, John R. A. Treatment of rheumatoid arthritis and related diseases. 4,426,384, Cl. 424-253.000.

Wyman, Ransome J. Elastomeric composition. 4,426,488, Cl. 524-783.000.

Xerox Corporation: *See*—
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Yamaguchi, Hiroshi, to Nissan Motor Company, Limited. Spark timing control apparatus for use with a internal combustion engine. 4,425,890, Cl. 123-418.000.

Yamaguchi, Hisashi; Kawada, Toyoshi; Kashiwara, Hirofumi; Ishizaki, Hiroyuki; and Murase, Kenji, to Fujitsu Limited. Self shift type gas discharge panel, driving system. 4,426,646, Cl. 340-769.000.

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Yamashita, Shigeo; Matsuda, Hiroshi; Kobayashi, Uichiroo; Kobayashi, Masayoshi; and Nakashima, Hisao, to Hitachi, Ltd. Semiconductor laser device. 4,426,702, Cl. 372-45.000.

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Yasumatsu, Toshihito; Nakase, Toshiaki; Kubozuka, Toshinori; and Kawabata, Kaoru, to Riken Vitamin Co., Ltd. Thermoplastic resin composition. 4,426,477, Cl. 524-306.000.

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Yonezawa, Toshio: *See*—
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Yoshida, Mitsuo; Masuda, Yoshinori; and Kashiwada, Akio, to Asahi Kasei Kogyo Kabushiki Kaisha. Homogeneous cation exchange membrane having a multi-layer structure. 4,426,271, Cl. 204-296.000.

Yoshida, Shuzo; Ono, Hironobu; Matsuo, Masashi; Hoshi, Kouich; Sueishi, Motoharu; and Ueda, Kazuo, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio feedback control system. 4,425,895, Cl. 123-489.000.

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Yoshisato, Akiyuki; and Igarashi, Sadao, to Alps Electric Co., Ltd. Phase-locked loop oscillator circuit utilizing a sub-loop with a second phase comparator. 4,426,627, Cl. 331-12.000.

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Young, William C., to Young Motor Corporation. Motor vehicle. 4,425,979, Cl. 180-264.000.

Younghouse, Lawrence B., to Exxon Research and Engineering Co. Reflector-coupled fluorescent solar collector. 4,425,907, Cl. 126-439.000.

Yu, Kin C.; and Goss, Gary J., to Honeywell Information Systems Inc. Communication multiplexer using a random access memory for storing an acknowledge response to an input/output command from a central processor. 4,426,679, Cl. 364-200.000.

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Zhukov, Leonid F.; and Chugunny, Evgeny G., to Institut Problem Litiya Akademii Nauk Ukrairskoi SSR. Refractory powder and method of producing same. 4,426,457, Cl. 501-128.000.

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Zimmerman, Michael A.: *See*—
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Zimmermann, Hubert; and Kempf, Thomas, to Otto Brand GmbH. Belt loop fabricating apparatus and method. 4,426,241, Cl. 156-217.000.

Zimmermann, Max: *See*—
Luthy, Hans; Isler, Eugen; Meier, Ewald; and Zimmermann, Max, 4,425,958, Cl. 164-119.000.

Zimmet, Hans: *See*—
Seifert, Rolf; Zimmet, Hans; Welzel, Herbert; and Reschke, Lothar, 4,426,146, Cl. 354-246.000.

Zweig, Judith E.: *See*—
Wood, Donald L.; and Zweig, Judith E., 4,426,254, Cl. 162-72.000.

37Mund, Ingo, to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG. Mold for casting intercell connectors. 4,425,959, Cl. 164-342.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JANUARY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brownfield, Keith E., to Warner & Swasey Company, The. Material-handling vehicle. Re. 31,500, Cl. 414-718.000.

Gallo, Charles F., Jr.; Hammond, Thomas J.; and Rees, James D., to Xerox Corporation. Illumination system utilizing two opposing DC lamps with an optimum barrel-shaped slit. Re. 31,499, Cl. 355-70.000.

Gingras, Richard P. In-line energization and de-energization of an external load in series with an external source of electricity in response to externally sensed parameters. Re. 31,502, Cl. 361-170.000.

Gulf & Western Manufacturing Company: *See*—
Nelsen, Roger J., Re. 31,497, Cl. 308-6.00R.

Hammond, Thomas J.: *See*—
Gallo, Charles F., Jr.; Hammond, Thomas J.; and Rees, James D., Re. 31,499, Cl. 355-70.000.

Keeler, Frederick D., to KLM Corporation, The. Tamper-proof closure. Re. 31,496, Cl. 215-252.000.

KLM Corporation, The: *See*—
Keeler, Frederick D., Re. 31,496, Cl. 215-252.000.

Lorenzo, John L., to Pitney Bowes, Inc. Method of producing a binary code and means for using the same. Re. 31,501, Cl. 235-435.000.

Nelsen, Roger J., to Gulf & Western Manufacturing Company. Anti-friction gibs for presses. Re. 31,497, Cl. 308-6.00R.

Pitney Bowes, Inc.: *See*—
Lorenzo, John L., Re. 31,501, Cl. 235-435.000.

Rees, James D.: *See*—
Gallo, Charles F., Jr.; Hammond, Thomas J.; and Rees, James D., Re. 31,499, Cl. 355-70.000.

Te Velde, Ties S., to U.S. Philips Corporation. Electrostatically controlled picture display device. Re. 31,498, Cl. 350-269.000.

U.S. Philips Corporation: *See*—
Te Velde, Ties S., Re. 31,498, Cl. 350-269.000.

Warner & Swasey Company, The: *See*—
Brownfield, Keith E., Re. 31,500, Cl. 414-718.000.

Xerox Corporation: *See*—
Gallo, Charles F., Jr.; Hammond, Thomas J.; and Rees, James D., Re. 31,499, Cl. 355-70.000.

Zublin, Casper W. Hydraulic jet well cleaning method and apparatus. Re. 31,495, Cl. 166-312.000.

LIST OF DESIGN PATENTEES

Ainsworth Nominees Pty. Ltd.: *See*—
Heywood, Joseph R., 272,254, Cl. D21-38.000.

Aktiebolaget Bofors: *See*—
Larsson, Torsten, 272,250, Cl. D15-28.000.

Alush, Joseph, to Ballert Orthopedic Corp. Contracture control orthosis. 272,281, 1-17-84, Cl. D24-64.000.

American Cyanamid Company: *See*—
Li, Lehmann K.; Campbell, Jay E.; and Reichmann, Richard H., 272,226, Cl. D8-48.000.

Antonacci, Frank; and Carluccio, Ronald. Blow dryer. 272,283, 1-17-84, Cl. D28-13.000.

Autry Industries, Inc.: *See*—
Autry, James C.; and Carmichael, Burkle J., 272,200, Cl. D2-320.000.

Autry, James C.; and Carmichael, Burkle J., to Autry Industries, Inc. Shoe sole. 272,200, 1-17-84, Cl. D2-320.000.

Backstrom, Olof F.: *See*—
Linden, Erkki O.; and Backstrom, Olof F., 272,227, Cl. D8-57.000.

Ballert Orthopedic Corp.: *See*—
Alush, Joseph, 272,281, Cl. D24-64.000.

Barthel, John E., to Dahl-Braden, Chapman Architects, Inc. Automatic teller machine booth. 272,293, 1-17-84, Cl. D99-43.000.

Baus, Heinz G. Holder for toilet articles. 272,208, 1-17-84, Cl. D6-86.000.

Berg, Marlin C. Grille for mounting onto the license plate holder in the front bumper of an automobile. 272,240, 1-17-84, Cl. D12-163.000.

Berkowitz, Richard: *See*—
Freeman, Del P., 272,239, Cl. D12-156.000.

Black, Richard F., Jr. Clip for holding a gas pump nozzle trigger in the open position. 272,231, 1-17-84, Cl. D8-349.000.

Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Chest of drawers. 272,210, 1-17-84, Cl. D6-165.000.

Budde, Donald F., to Urethane Roller Specialists, Inc. Swing seat. 272,260, 1-17-84, Cl. D21-246.000.

Bustle, Klaus: *See*—
Rock, Erich; and Bustle, Klaus, 272,211, Cl. D6-194.000.

Campbell, Jay E.: *See*—
Li, Lehmann K.; Campbell, Jay E.; and Reichmann, Richard H., 272,226, Cl. D8-48.000.

Campbell, Ralph L. Combination lock vault. 272,292, 1-17-84, Cl. D99-28.000.

Cardinal American Corporation: *See*—
Sroub, Joseph W., 272,286, Cl. D34-21.000.

Carluccio, Ronald: *See*—
Antonacci, Frank; and Carluccio, Ronald, 272,283, Cl. D28-13.000.

Carmichael, Burkle J.: *See*—
Autry, James C.; and Carmichael, Burkle J., 272,200, Cl. D2-320.000.

Central Trust Company, N.A., The: *See*—
Hauser, Charles; and Johnson, Sharon, 272,291, Cl. D99-28.000.

Chatani, Yasushi; and Tsuchikura, Toshio, to Kawada Co., Ltd. Toy block. 272,255, 1-17-84, Cl. D21-108.000.

Chatani, Yasushi; and Tsuchikura, Toshio, to Kawada Co., Ltd. Toy block. 272,256, 1-17-84, Cl. D21-108.000.

Cho, Kazunobu, to Dart Industries Inc. Drainer tray or the like. 272,222, 1-17-84, Cl. D7-47.000.

Claire, Edward W.: *See*—
Dahlgren, William V., Jr.; Silverstein, Lewis S.; and Claire, Edward W., 272,241, Cl. D13-35.000.

Convergent Technologies, Inc.: *See*—
Sanders, Matthew H. L.; Stillinger, Scott H.; Nuttall, Michael J.; and Moggridge, William G., 272,248, Cl. D14-109.000.
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Daenen, Robert H. C. M.; and Goyens-Daenen, Rita, to Dart Industries Inc. Tiered serving dish or the like. 272,212, 1-17-84, Cl. D7-4.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Food storage cup or cover or the like. 272,213, 1-17-84, Cl. D7-6.000.

Daenen, Robert H. C. M.; and Goyens-Daenen, Rita, to Dart Industries Inc. Covered serving dish or the like. 272,214, 1-17-84, Cl. D7-17.000.

Daenen, Robert H. C. M.; and Goyens-Daenen, Rita, to Dart Industries Inc. Serving dish or the like. 272,215, 1-17-84, Cl. D7-22.000.

Daenen, Robert H. C. M.; and Goyens-Daenen, Rita, to Dart Industries Inc. Serving dish or the like. 272,216, 1-17-84, Cl. D7-23.000.

Daenen, Robert H. C. M.; and Goyens-Daenen, Rita, to Dart Industries Inc. Serving dish or the like. 272,217, 1-17-84, Cl. D7-23.000.

Daenen, Robert H. C. M.; and Goyens-Daenen, Rita, to Dart Industries Inc. Serving dish or the like. 272,218, 1-17-84, Cl. D7-27.000.

Daenen, Robert H. C. M.; and Goyens-Daenen, Rita, to Dart Industries Inc. Dish pedestal or the like. 272,221, 1-17-84, Cl. D7-39.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Closured food storage cup or the like. 272,223, 1-17-84, Cl. D7-79.000.

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Dahlgren, William V., Jr.; Silverstein, Lewis S.; and Claire, Edward W. Control panel for use as a housing for electrical and electronic control circuitry. 272,241, 1-17-84, Cl. D13-35.000.

Daiwa Seiko, Inc.: *See*—
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Dart Industries Inc.: *See*—
Cho, Kazunobu, 272,222, Cl. D7-47.000.
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Daenen, Robert H. C. M., 272,223, Cl. D7-79.000.
DeCoster, Pieter K. J., 272,225, Cl. D7-319.000.
De Boer, Peter, to Gispen & Staalmeubel B.V. Chair. 272,204, 1-17-84, Cl. D6-31.000.
De Boer, Peter, to Gispen & Staalmeubel B.V. Chair. 272,205, 1-17-84, Cl. D6-31.000.
DeCoster, Pieter K. J., to Dart Industries Inc. Jug or the like. 272,225, 1-17-84, Cl. D7-319.000.
Di Bartolo, Vincent, to Mele Manufacturing Company, Inc. Case for jewels. 272,203, 1-17-84, Cl. D3-75.000.
Dillon, Richard R.; Graham, John E.; and Kmetz, David G., to Honeywell Information Systems Inc. Desktop computer system. 272,247, 1-17-84, Cl. D14-106.000.
Drag Specialties, Inc.: *See*—
Rudd, Thomas, 272,199, Cl. D2-232.000.
Draheim, Harvey J.: *See*—
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 272,210, Cl. D6-165.000.
Du Plessis, Louis A. Game board. 272,253, 1-17-84, Cl. D21-17.000.
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Farnam Companies, Inc.: *See*—
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Freeman, Del P., to Berkowitz, Richard, Trustee. Modular hatchback enclosure accessory. 272,239, 1-17-84, Cl. D12-156.000.
Garcia, Joseph C. Belt mounted holder for allen wrenches. 272,201, 1-17-84, Cl. D2-400.000.
Gillett, Peter J. Mobile golf.club container. 272,285, 1-17-84, Cl. D34-15.000.
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Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Linear closure surgical stapler. 272,270, 1-17-84, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Linear closure surgical stapler. 272,271, 1-17-84, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Linear closure surgical stapler. 272,272, 1-17-84, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Linear closure surgical stapler. 272,273, 1-17-84, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Linear closure surgical stapler. 272,274, 1-17-84, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Linear closure surgical stapler. 272,275, 1-17-84, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Linear closure surgical stapler. 272,276, 1-17-84, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Linear closure surgical stapler. 272,277, 1-17-84, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Linear closure surgical stapler. 272,278, 1-17-84, Cl. D24-26.000.
Green, David T., to United States Surgical Corporation. Disposable staple cartridge for linear closure surgical stapler. 272,279, 1-17-84, Cl. D24-27.000.
Hanks, Robert E. Screw starter. 272,230, 1-17-84, Cl. D8-82.000.
Hauser, Charles; and Johnson, Sharon, to Central Trust Company, N.A., The. Automated teller machine module. 272,291, 1-17-84, Cl. D99-28.000.
Hayes, Thomas H., to Ethyl Corporation. Container handle or similar article. 272,234, 1-17-84, Cl. D9-434.000.
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Heywood, Joseph R., to Ainsworth Nominees Pty. Ltd. Poker machine cabinet. 272,254, 1-17-84, Cl. D21-38.000.
Holce, Thomas J.; and Huckins, Charles M., to Sentrol, Inc. Latching housing for miniature electrical components. 272,242, 1-17-84, Cl. D13-40.000.
Honeywell Information Systems Inc.: *See*—
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Leffel, Darrel O. Livestock dust bag stand. 272,284, 1-17-84, Cl. D30-45.000.
Li, Lehmann K.; Campbell, Jay E.; and Reichmann, Richard H., to American Cyanamid Company. Staple extracting instrument. 272,226, 1-17-84, Cl. D8-48.000.
Liebrick, William C.; and Morvillo, Charles A., to Lee's Manufacturing Co., Inc. Jewelry setting. 272,238, 1-17-84, Cl. D11-92.000.
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McKay, Kurt J. Contemplation chamber. 272,280, 1-17-84, Cl. D24-38.000.
Meister, Robert L. Diver's towable diving plane. 272,259, 1-17-84, Cl. D21-236.000.
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Parmentier, Christian. Multi-compartmented packaging container for ice cream or the like. 272,233, 1-17-84, Cl. D9-345.000.
Perkins, Sonnie J. Combined golf putter hosel and alignment indicator. 272,257, 1-17-84, Cl. D21-221.000.
Pfaff, Wayne K. Material handling transport tray or the like. 272,288, 1-17-84, Cl. D34-40.000.
Preciado, David. Intruder alarm for doors, windows and the like. 272,237, 1-17-84, Cl. D10-106.000.
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Roth, Daniel T. Deflector for swimming pool skimmer. 272,282, 1-17-84, Cl. D25-02.000.
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Scheid, William J., to Motorola, Inc. Radio pager or similar article. 272,244, 1-17-84, Cl. D14-68.000.
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Voltz, Carl W., 272,264, Cl. D24-1.100.
Voltz, Carl W., 272,265, Cl. D24-1.100.
Voltz, Carl W., 272,266, Cl. D24-1.100.
Voltz, Carl W., 272,267, Cl. D24-1.100.
Voltz, Carl W., 272,268, Cl. D24-1.100.
Voltz, Carl W., 272,269, Cl. D24-1.100.
Thompson, James S. Plate or similar article. 272,220, 1-17-84, Cl. D7-35.000.
Tsuchikura, Toshio: *See*—
Chatani, Yasushi; and Tsuchikura, Toshio, 272,255, Cl. D21-108.000.
Chatani, Yasushi; and Tsuchikura, Toshio, 272,256, Cl. D21-108.000.
United States Surgical Corporation: *See*—
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,270, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,271, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,272, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,273, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,274, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,275, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,276, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,277, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,278, Cl. D24-26.000.
Green, David T., 272,279, Cl. D24-27.000.
Urethane Roller Specialists, Inc.: *See*—
Budde, Donald F., 272,260, Cl. D21-246.000.
Vigna, Ralph M., to Eastman Kodak Company. Printing attachment for a photographic printer or similar article. 272,252, 1-17-84, Cl. D16-37.000.
Voltz, Carl W., to Sybron Corporation. Dental treatment cabinet. 272,264, 1-17-84, Cl. D24-1.100.
Voltz, Carl W., to Sybron Corporation. Dental treatment cabinet. 272,265, 1-17-84, Cl. D24-1.100.
Voltz, Carl W., to Sybron Corporation. Dental treatment cabinet. 272,266, 1-17-84, Cl. D24-1.100.
Voltz, Carl W., to Sybron Corporation. Dental treatment cabinet. 272,267, 1-17-84, Cl. D24-1.100.
Voltz, Carl W., to Sybron Corporation. Dental treatment cabinet. 272,268, 1-17-84, Cl. D24-1.100.
Voltz, Carl W., to Sybron Corporation. Dental treatment cabinet. 272,269, 1-17-84, Cl. D24-1.100.
Wilson, Kevin J. Fixture cleaner. 272,230, 1-17-84, Cl. D32-51.000.
Xerox Corporation: *See*—
Hutcheson, Claude H., 272,246, Cl. D14-94.000.
Yagami, Richard: *See*—
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,270, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,271, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,272, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,273, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,274, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,275, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,276, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,277, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,278, Cl. D24-26.000.
Yasui Sangyo Co., Ltd.: *See*—
Kameda, Tamotsu, 272,287, Cl. D34-31.000.
Yoshihama, Manzo, to Ricoh Company, Ltd. Developer container. 272,251, 1-17-84, Cl. D16-32.000.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See*—
Christensen, Jack E., 5,177, Cl. 15.000.
Christensen, Jack E., to Armstrong Nurseries, Inc. Rose plant. 5,177, 1-17-84, Cl. 15.000.
Garabedian, John M. Plum tree. 5,178, 1-17-84, Cl. 38.000.
L. Daehnfeldt Ltd.: *See*—
Schelbeck, Erland V.
Schelbeck, Erland V., to L. Daehnfeldt Ltd. Begonia plant. 5,179, 1-17-84, Cl. 68.000.
Williams, Ernest D. Miniature Rose plant. 5,176, 1-17-84, Cl. 7.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 17, 1984

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,425,667
18 4,425,668
436 4,425,669

CLASS 3

1.5 4,425,670

CLASS 4

111.3 4,425,671
596 4,425,672

CLASS 5

64 4,425,673
68 4,425,674
440 4,425,675
450 4,425,676

CLASS 8

138 4,426,203
492 4,426,204
523 4,426,205
528 4,426,206

CLASS 15

104.92 4,425,677

CLASS 17

44.2 4,425,678

CLASS 24

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20 S 4,425,681
4,425,682
351 4,425,690
381 4,425,683
434 4,425,684
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656 4,425,688
664 4,425,687
4,425,689

CLASS 28

166 4,425,691
727 4,425,923

CLASS 29

90 R 4,425,693
110 4,425,694
113 R 4,425,695
157.3 AH 4,425,696
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571 4,425,700
603 4,425,701
606 4,425,702
611 4,425,692
724 4,425,703
764 4,425,704

CLASS 30

84 4,425,705
116 4,425,706
120.3 4,425,707
133 4,425,708
151 4,425,709
229 4,425,710
324 4,425,711

CLASS 33

12 4,425,712
174 D 4,425,713
187 4,425,714
199 R 4,425,715
355 R 4,425,716
361 4,425,717

CLASS 34

1 4,425,718
156 4,425,719
233 4,425,720

CLASS 36

11.5 4,425,721

CLASS 37

2 P 4,425,722
55 4,425,723

CLASS 40

11 A 4,425,724
152 4,425,725
301 4,425,726
600 4,425,727
607 4,425,728

CLASS 43

21.2 4,425,729
42.11 4,425,730
58 4,425,731
81 4,425,732
115 4,425,733

CLASS 44

50 4,426,207
56 4,426,208

CLASS 46

74 D 4,425,734
202 4,425,735

CLASS 47

1.5 4,425,736
58 4,425,737

CLASS 49

310 4,425,738
424 4,425,739

CLASS 51

295 4,426,209

CLASS 52

70 4,425,741
81 4,425,740
90 4,425,742
169.14 4,425,744
169.5 4,425,743
235 4,425,745
309.12 4,425,746
404 4,425,747
436 4,425,748
509 4,425,749

CLASS 55

73 4,426,210
296 4,426,211
345 4,426,212
466 4,426,213
511 4,426,214

CLASS 56

327 A 4,425,751
341 4,425,752
4,425,753

CLASS 57

265 4,425,754

CLASS 60

39.092 4,425,756
39.182 4,425,757
39.55 4,425,755
403 4,425,758
420 4,425,759
547.1 4,425,760
611 4,425,761
646 4,425,762
693 4,425,763

CLASS 62

6 4,425,764
133 4,425,765
4,425,766
212 4,425,767
237 4,425,768

CLASS 63

32 4,425,769

CLASS 65

4.21 4,426,215
IR.1 4,426,216
135 4,426,217
241 4,426,218

CLASS 70

252 4,425,770
276 4,425,771
456 R 4,425,772

CLASS 71

91 4,426,219
98 4,426,220
105 4,426,221
111 4,426,222

CLASS 72

142 4,425,773
257 4,425,774
270 4,425,775
306 4,425,776
325 4,425,777
347 4,425,778
356 4,425,779
370 4,425,780
379 4,425,781
391 4,425,782
393 4,425,783
459 4,425,784

CLASS 73

9 4,425,785
12 4,425,786
32 R 4,425,787
35 4,425,788
40.5 R 4,425,789
55 4,425,790
117.3 4,425,791
204 4,425,792
290 R 4,425,793
293 4,425,794
295 4,425,795
312 4,425,796
379 4,425,797
659 4,425,798
718 4,425,799
730 4,425,800
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827 4,425,802
861.18 4,425,803
861.28 4,425,804
861.29 4,425,805
861.61 4,425,806
861.65 4,425,807
862.45 4,425,809
862.65 4,425,808
863.11 4,425,810
4,425,811

CLASS 74

6 4,425,812
87 4,425,813
89.15 4,425,814
425 4,425,815
439 4,425,816
467 4,425,817
469 4,425,818
489 4,425,819
579 R 4,425,820
604 4,425,821
640 4,425,822
665 GE 4,425,823
750 B 4,425,824
804 4,425,825

CLASS 75

10 R 4,426,223
49 4,426,224
118 R 4,426,225

CLASS 81

3.36 4,425,826
57.19 4,425,827
57.39 4,425,828

CLASS 83

62.1 4,425,829
833 4,425,830

CLASS 84

1.16 4,425,831
298 4,425,832

CLASS 86

44 4,425,833

CLASS 89

1 A 4,425,834

CLASS 91

317 4,425,835
405 4,425,836

CLASS 92

71 4,425,837
86 4,425,838

CLASS 98

40 R 4,425,839
40 V 4,425,840

CLASS 99

605 4,425,841

CLASS 100

37 4,425,842
229 A 4,425,843

CLASS 101

93.14 4,425,844
93.34 4,425,845
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269 4,425,847
350 4,425,848

CLASS 102

275.12 4,425,849
307 4,425,850

CLASS 104

20 4,425,851

CLASS 106

22 4,426,226
27 4,426,227
203 4,426,228
270 4,426,229
272 4,426,230
288 Q 4,426,231

CLASS 108

56.3 4,425,852

CLASS 109

25 4,425,853

CLASS 110

262 4,425,854
263 4,425,855
346 4,425,856

CLASS 111

85 4,425,857

CLASS 112

121.12 4,425,858
158 R 4,425,859
311 4,425,860

CLASS 114

71 4,425,861
199 4,425,862
363 4,425,863

CLASS 116

204 4,425,864

CLASS 118

19 4,425,865
58 4,425,866
120 4,425,867
314 4,425,868
4,425,869
326 4,425,870
664 4,425,871

CLASS 119

14.47 4,425,872
51 R 4,425,873
156 4,425,874

CLASS 122

134 4,425,875

CLASS 123

3 4,425,876
41.08 4,425,878
41.1 4,425,877
41.12 4,425,879
44 C 4,425,880
52 MV 4,425,881
90.3 4,425,882
242 4,425,883
272 4,425,884
299 4,425,885
339 4,425,886
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357 4,425,889
418 4,425,890
425 4,425,891
430 4,425,892
446 4,425,893
4,425,894
489 4,425,895
501 4,425,896
527 4,425,897
4,425,898
549 4,425,899

CLASS 125

30 R 4,425,900

CLASS 126

6 4,425,901
360 R 4,425,902
419 4,425,903
424 4,425,904
425 4,425,905
427 4,425,906
439 4,425,907

CLASS 127

46.3 4,426,232

CLASS 128

1 R 4,425,908
16 4,425,909
52 4,425,910
80 C 4,425,912
133 4,425,913
200.14 4,425,914
200.26 4,425,911
325 4,425,915
403 4,425,916
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635 4,425,918
658 4,425,919
672 4,425,920
690 4,425,921
691 4,425,922
745 4,425,924

CLASS 130

22 A 4,425,925

CLASS 132

46 R 4,425,926

CLASS 133

8 A 4,425,927

CLASS 134

21 4,426,233
122 R 4,425,928

CLASS 135

102 4,425,929

CLASS 136

256 4,426,546

CLASS 137

1 4,425,930
53 4,425,931
143 4,425,932
172 4,425,933
223 4,425,934
315 4,425,935
340 4,425,936
480 4,425,937
489 4,425,938
599.2 4,425,939
627.5 4,425,940
871 4,425,941

CLASS 138

38 4,425,942
89 4,425,943
4,425,944
96 T 4,425,945

CLASS 139

11 4,425,946

CLASS 140

105 4,425,947
119 4,425,948

CLASS 141

1 4,425,949

CLASS 144

194 4,425,950
208 E 4,425,951
246 F 4,425,952

CLASS 148

1.5 4,426,234
12 C 4,426,235
36 4,426,236
175 4,426,237

CLASS 149

60 4,426,238

CLASS 152

360 4,425,953

CLASS 156

64 4,426,239
99 4,426,240
217 4,426,241
252 4,426,242
307.3 4,426,243
498 4,426,244
511 4,426,245
643 4,426,246
4,426,247
645 4,426,248
653 4,426,249
655 4,426,250
656 4,426,251
665 4,426,252
668 4,426,253

CLASS 157

1.22 4,425,954

CLASS 160

168 R 4,425,955
4,425,956

CLASS 162

23 4,426,258
72 4,426,254
106 4,426,255
237 4,426,256
336 4,426,257

CLASS 164

37 4,425,957
119 4,425,958
342 4,425,959
426 4,425,960
440 4,425,961

CLASS 165

92 4,425,962
104.32 4,425,963
171 4,425,964

CLASS 166

106 4,425,965
241 4,425,966
259 4,425,967
295 4,425,968
312 Re.31,495

CLASS 171

16 4,425,969

CLASS 172

7 4,425,970
311 4,425,971
551 4,425,972
574 4,425,973

CLASS 174

31 R 4,426,547
72 R 4,426,548
110 PM 4,426,549
128 R 4,426,550

CLASS 177

1 4,425,974
50 4,425,975

CLASS 179

6.07 4,426,554
84 L 4,426,555
115.5 DV 4,426,556
117 4,426,553

CLASS 180

56 4,425,976
225 4,425,977
243 4,425,978
264 4,425,979

CLASS 181

208 4,425,980
286 4,425,981

CLASS 182

36 4,425,982
96 4,425,983
106 4,425,984
121 4,425,985

CLASS 184

3.2 4,425,986

CLASS 188

67 4,425,987

CLASS 192

18 R 4,425,988
48.92 4,425,989
53 G 4,425,990
70.27 4,425,991
82 T 4,425,992
85 A 4,425,993
85 AA 4,425,994

CLASS 198

605 4,425,995
651 4,425,996

CLASS 200

16 D 4,426,557
51.09 4,426,558
67 DB 4,426,559
144 B 4,426,560
148 A 4,426,561
151 4,426,562
334 4,426,563

CLASS 202

248 4,426,259

CLASS 204

33 4,426,260
98 4,426,261
4,426,262
101 4,426,263
192 C 4,426,268
192 M 4,426,265
192 R 4,426,264
4,426,267
206 4,426,266
242 4,426,269
257 4,426,270
296 4,426,271
4,426,272
297 W 4,426,273
298 4,426,274
4,426,275

CLASS 206

0.84 4,425,997
306 4,425,998
444 4,425,999
455 4,426,000
507 4,426,001
523 4,426,002
524.4 4,426,003
525 4,426,004
526 4,426,035

CLASS 208

60 4,426,276
127 4,426,277
130 4,426,278
138 4,426,279
254 R 4,426,280

CLASS 209

11 4,426,281
167 4,426,282
211 4,426,283
581 4,426,005
593 4,426,006

CLASS 210

90 4,426,284
109 4,426,285
121 4,426,286
184 4,426,287
242.3 4,426,288
403 4,426,289
516 4,426,290
634 4,426,291
635 4,426,292
636 4,426,293
662 4,426,294
772 4,426,295

CLASS 211

40 4,426,007
49 D 4,426,008
86 4,426,009
163 4,426,010
193 4,426,011

CLASS 213

135 4,426,012

CLASS 215

252 Re.31,496

CLASS 219

10.77 4,426,564
130.01 4,426,565
137.41 4,426,566
225 4,426,567
270 4,426,568
272 4,426,569
354 4,426,570
373 4,426,571
502 4,426,572
544 4,426,573

CLASS 220

66 4,426,013
307 4,426,014
403 4,426,015

CLASS 221

75 4,426,016
222 4,426,017

CLASS 222

1 4,426,018
88 4,426,019
108 4,426,020
129.1 4,426,021
130 4,426,022
132 4,426,023
173 4,426,024
182 4,426,025
402.13 4,426,026
529 4,426,027

CLASS 224

325 4,426,028

CLASS 225

49 4,426,029

CLASS 226

181 4,426,030

CLASS 228

56 4,426,033
121 4,426,031
157 4,426,032

CLASS 229

23 BT 4,426,034

CLASS 235

1 C 4,426,574
435 Re.31,501

CLASS 236

34.5 4,426,036

CLASS 237

19 4,426,037

CLASS 239

265.15 4,426,038
415 4,426,039
428.5 4,426,040
468 4,426,041

CLASS 241

21 4,426,042
101.2 4,426,043
236 4,426,044

CLASS 242

84.2 G 4,426,045
181 4,426,046
197 4,426,047

CLASS 244

3.23 4,426,048
69 4,426,049
135 R 4,426,050
137 R 4,426,051
168 4,426,052
173 4,426,053
212 4,426,054

CLASS 248

184 4,426,055
225.1 4,426,056
235 4,426,057
594 4,426,058
637 4,426,059

CLASS 249

13 4,426,060
45 4,426,061

CLASS 250

253 4,426,575
283 4,426,576
310 4,426,577
363 S 4,426,578
374 4,426,579
4,426,580
380 4,426,581
396 ML 4,426,582
398 4,426,583
492.2 4,426,584

CLASS 251

7 4,426,062
149.9 4,426,063

CLASS 252

8.55 C 4,426,296
8.55 D 4,426,302
4,426,303
8.6 4,426,297
8.75 4,426,304
8.8 4,426,299
8.9 4,426,298
4,426,300
4,426,301
49.6 4,426,305
51.5 A 4,426,306
70 4,426,307
4,426,308
75 4,426,309
106 4,426,310
143 4,426,311
299.1 4,426,312
353 4,426,313
522 R 4,426,321

CLASS 254

342 4,426,064

CLASS 260

97.7 4,426,322
112 R 4,426,323
112.5 R 4,426,324
4,426,325
146 R 4,426,326
160 4,426,327
162 4,426,328
398.6 4,426,329
403 4,426,330
463 4,426,331
465 F 4,426,332
507 R 4,426,333
509 4,426,334
968 4,426,335
986 4,426,336

CLASS 264

0.5 4,426,338
4 4,426,337
22 4,426,339
29.1 4,426,340
40.1 4,426,341
45.9 4,426,065
109 4,426,342
147 4,426,343
171 4,426,344
252 4,426,066
256 4,426,345
290.2 4,426,346
294 4,426,347
328.6 4,426,348
346 4,426,349

CLASS 266

191 4,426,067
217 4,426,068
246 4,426,069

CLASS 267

91 4,426,070

CLASS 269

325 4,426,071

CLASS 270

53 4,426,072

CLASS 271

251 4,426,073
302 4,426,074

CLASS 272

69 4,426,075
109 4,426,076
118 4,426,077

CLASS 273

43 R 4,426,078
84 R 4,426,079
118 A 4,426,080
127 D 4,426,081
143 R 4,426,082
164 4,426,083
254 4,426,084
392 4,426,085

CLASS 277

1 4,426,086
3 4,426,087
14 R 4,426,088
27 4,426,089
4,426,090
83 4,426,091
96.1 4,426,092
110 4,426,093
153 4,426,094
207 A 4,426,095

CLASS 280

411 C 4,426,096
415 A 4,426,097
504 4,426,098
655 4,426,099
770 4,426,100
772 4,426,101
804 4,426,102

CLASS 285

12 4,426,103
26 4,426,104
92 4,426,105
236 4,426,106

CLASS 290

38 B 4,426,585
44 4,426,586

CLASS 292

201 4,426,107
307 B 4,426,108

CLASS 293

133 4,426,109

CLASS 294

88 4,426,110

CLASS 296

95 R 4,426,111
223 4,426,112

CLASS 297

219 4,426,113
232 4,426,114
423 4,426,115

CLASS 301

9 R 4,426,116

CLASS 303

6 C 4,426,117

CLASS 307

66 4,426,587
124 4,426,588
254 4,426,589
255 4,426,590
358 4,426,591

CLASS 308

5 R 4,426,118
6 C 4,426,119
6 R Re.31,497

CLASS 310

52 4,426,592
91 4,426,593
233 4,426,594
313 D 4,426,595

CLASS 312

100 4,426,120

CLASS 313

231.41 4,426,597
331 4,426,598
389 4,426,599
487 4,426,600
534 4,426,596

CLASS 315

39.51 4,426,601
58 4,426,602
289 4,426,603

CLASS 318

334 4,426,604
347 4,426,605
375 4,426,606
628 4,426,607
685 4,426,608
729 4,426,609
798 4,426,610
803 4,426,611

CLASS 320

39 4,426,612

CLASS 322

21 4,426,613

CLASS 323

243 4,426,614
322 4,426,615

CLASS 324

57 R 4,426,616
62 4,426,617
65 CR 4,426,618
73 PC 4,426,619
83 D 4,426,620
439 4,426,621

CLASS 329

143 4,426,622
178 4,426,623

CLASS 330

86 4,426,624
254 4,426,625
267 4,426,626

CLASS 331

12 4,426,627
96 4,426,628

CLASS 333

165 4,426,629
174 4,426,630
202 4,426,631

CLASS 337

347 4,426,632

CLASS 338

25 4,426,633
161 4,426,634
183 4,426,635
314 4,426,636

CLASS 339

38 4,426,121
45 M 4,426,122
75 MP 4,426,123
94 M 4,426,124
99 R 4,426,125
125 R 4,426,126
177 R 4,426,127
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